NIWeek

WORLDWIDE GRAPHICAL SYSTEM DESIGN
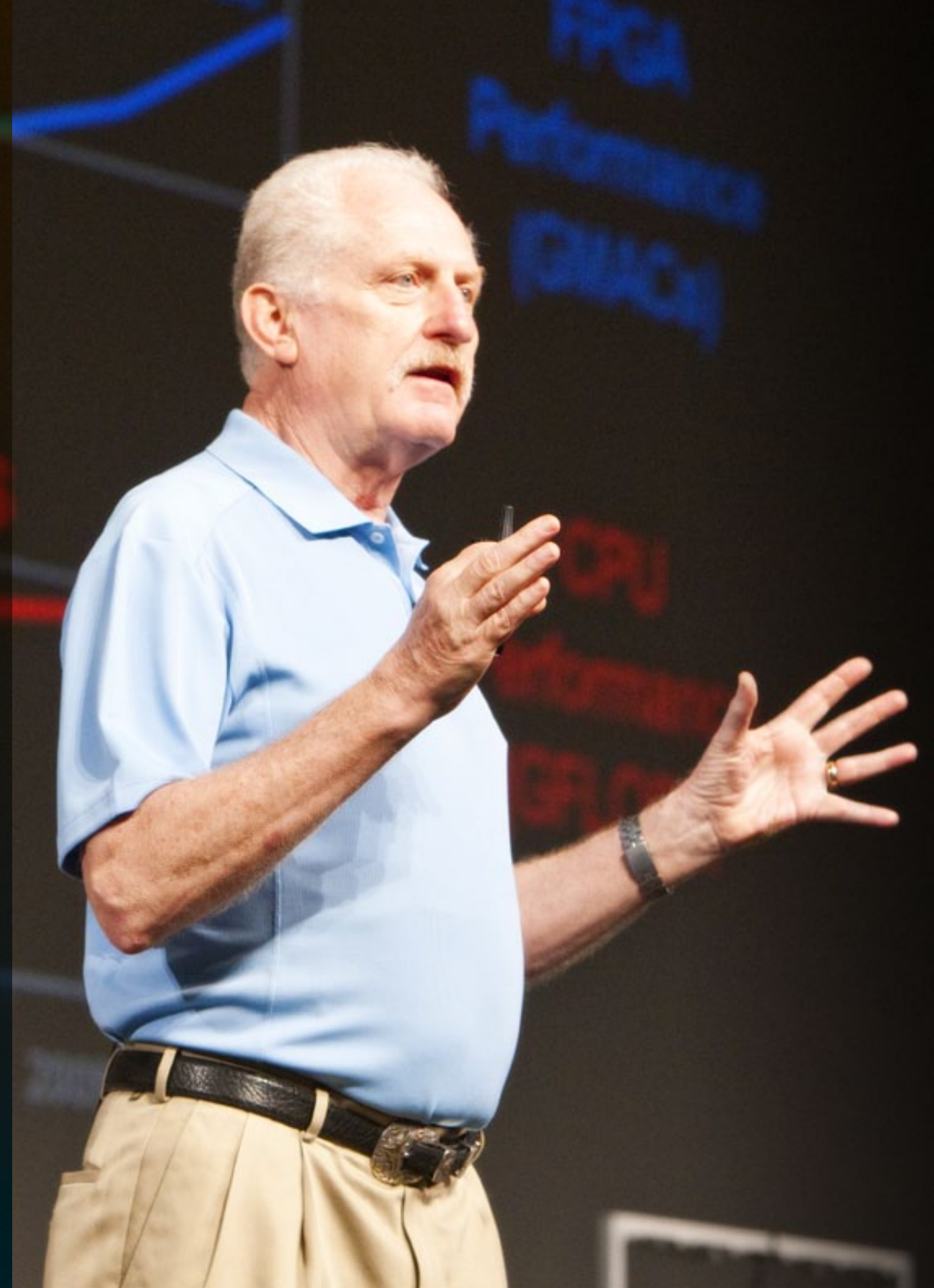
CONFERENCE

AUGUST 2–4, 2011

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Dear Colleague,

Welcome to NIWeek 2011 – the world's leading graphical system design conference and exhibition. In the next few days, you will join a community of more than 3,000 fellow innovators, educators, engineers, scientists, and NI developers to explore the latest technologies to help you increase productivity and improve your efficiency.

At NIWeek, you will see how other engineers use graphical system design to create advanced test and measurement systems. From increasing efficiencies in countless design, test, and control applications to developing emerging technologies and educating future innovators, people like you are using graphical system design, virtual instrumentation, and modular hardware to revolutionize the way the world works. In addition, you can explore how the engineers of the future will benefit from graphical system design and learn how NI LabVIEW software can launch you, your applications, and your career into the next 25 years.

NIWeek 2011 offers more than 250 interactive technical sessions and hands-on workshops, demonstrations of the latest NI products, continuing education courses and certification exams, a massive exhibition floor, and keynote presentations from some of today's brightest minds.

While in Austin, don't forget to enjoy the sights and sounds of the "Live Music Capital of the World." Additionally, be sure to visit **ni.com/niweekcommunity** for detailed information and updates during NIWeek 2011 and to stay connected with the NI Community throughout the year.

Thank you to all our sponsors, exhibitors, and attendees for participating in the 17th annual NIWeek. I encourage you to take advantage of this ultimate learning environment to advance your skills, explore the possibilities of graphical system design, and inspire innovation in your own work.

Sincerely,

James Truchard
President, CEO, and Cofounder
National Instruments

KEYNOTE PRESENTATIONS

The NIWeek keynote presentations give attendees a first glimpse at new, cutting-edge innovations from National Instruments as well as an opportunity to learn about customers and real-world solutions using tools from NI. Start each morning of the conference by learning about new products through demonstrations and customer presentations from NI leadership and engineers, and learn how LabVIEW can help you launch your applications and your career into the next 25 years.

TUESDAY, AUGUST 2

▶ **Dr. James Truchard,** President, CEO, and Cofounder, NI
Join Dr. James Truchard, who has served as CEO of National Instruments for 35 years, to kick off your NIWeek experience and celebrate the 25th anniversary of LabVIEW. Listen as he discusses graphical system design and the latest innovations that will help engineers and scientists address some of the Grand Challenges for Engineering.

▶ **Eric Starkloff,** Vice President of Product Marketing for Test and Industrial Embedded, NI
Eric Starkloff's leadership and vision helped the PXI platform become one of the most successful test platforms in the test industry. He currently leads the product marketing of NI system-level products, including PXI, modular instruments, and NI CompactRIO. Join Eric and NI engineers as they reveal the latest products and technologies that are making the graphical system design platform a mainstream approach for engineers and scientists around the world. Watch product demonstrations and real-world solutions that span the entire system design process.

KEYNOTE PRESENTATIONS

WEDNESDAY, AUGUST 3

▶ **Jeff Kodosky,** Cofounder, Business and Technology Fellow, NI
Hear from Jeff Kodosky, the "Father of LabVIEW," as he looks back at the creation of graphical programming and shares fundamental programming concepts vital to the next 25 years of graphical system design for meeting the most demanding application challenges.

▶ **Shelley Gretlein,** Director of Core Platforms – Software, NI
Shelley Gretlein, a key member of a new generation of leaders at NI, has been instrumental in the evolution of LabVIEW and empowering domain experts with graphical system design. Join Shelley in celebrating the 25th anniversary of the LabVIEW and see how engineers and scientists around the world use LabVIEW to innovate and develop pivotal world-changing applications. Learn how the global LabVIEW community will address the world's biggest engineering challenges over the next 25 years.

THURSDAY, AUGUST 4

▶ **Ray Almgren,** Vice President of Product Marketing for Core Platforms, NI
As a 24-year NI veteran, Ray Almgren is the visionary behind the company's efforts to enhance science and engineering education and inspire students to pursue technical careers – creating and empowering the innovators of tomorrow. Join him and explore student-designed projects that showcase how graphical system design and hands-on learning are changing the world around us.

▶ **Tim Samaras,** Severe Storms Researcher, Storm Chasers
Tim Samaras is a National Geographic Emerging Explorer and costar of the Discovery Channel series *Storm Chasers*. He is passionate about the advancement of science and engineering and an expert on all weather phenomena. He is currently working on developing cutting-edge instrumentation to help engineers and scientists explore and address one of the grandest challenges society faces, the frontiers of nature. Some of his accomplishments in this field include being a *Guinness Book of World Records* holder for measuring the lowest pressure of a tornado and being the only person to collect video from inside a tornado.

All keynote presentations are held from 8:30 to 10:00 a.m. in Ballroom D.

CONFERENCE INFORMATION

▶ **ON-SITE CHECK-IN HOURS**

Sunday, July 31 ▶ 7:30 a.m.–5:00 p.m.
Monday, August 1 ▶ 7:00 a.m.–7:00 p.m.
Tuesday, August 2 ▶ 7:30 a.m.–7:00 p.m.

Wednesday, August 3 ▶ 7:30 a.m.–6:00 p.m.
Thursday, August 4 ▶ 7:30 a.m.–1:00 p.m.

▶ **DAILY CONTINENTAL BREAKFAST**

8:00–10:00 a.m. ▶ Ballroom D Foyer

▶ **DAILY LUNCH**

11:30 a.m.–1:00 p.m. ▶ Exhibition Hall

Lunch is provided for full-conference attendees and Expo Plus Pass holders.
Conference name badges are required for admission.

▶ **AFTERNOON BREAKS**

Enjoy refreshments between sessions on the third floor outside Room 18.

▶ **EXHIBITION HALL HOURS**

Monday, August 1 ▶ 5:30–7:00 p.m.
Tuesday, August 2 ▶ 10:30 a.m.–7:00 p.m.

Wednesday, August 3 ▶ 10:30 a.m.–6:00 p.m.
Thursday, August 4 ▶ 10:30 a.m.–1:00 p.m.

▶ **NATIONAL INSTRUMENTS CAMPUS TOUR**

Visit National Instruments headquarters to tour the manufacturing facilities and view the results of more than three decades of innovation. Discover how NI has integrated its campus into a native Texas landscape that promotes the NI culture. Also learn how NI reduces its environmental impact and creates a better world for employees, customers, and fellow global citizens.

Shuttle runs from the Austin Convention Center to National Instruments starting at 10:00 a.m.

Thursday, August 4 ▶ 10:00 a.m.–12:30 p.m. ▶ Austin Convention Center Registration Area

▶ **VISIT THE NI STORE**

Take the NIWeek experience home with you. Visit the NI Store, located near the dining area in the Exhibition Hall, to purchase NI merchandise including stylish polos and other apparel. The store accepts American Express, MasterCard, and VISA.

Open during Exhibition Hall hours.

SOCIAL MEDIA @NIWeek

▶ **JOIN THE COMMUNITY**

Whether you're looking for session presentations after NIWeek, code and videos of key demos, conference updates on our blog, or networking opportunities, the NIWeek online community has it all. Bookmark **ni.com/niweekcommunity** and see for yourself.

Joining the NI Developer Community has perks outside of NIWeek, too. Visit **ni.com/community** to connect with thousands of technical experts all over the world:

- *Share and vote on LabVIEW feature ideas*
- *Download example code to get your project up and running*
- *Learn about cutting-edge technologies*
- *Join a group and connect with other like-minded individuals*
- *Participate in existing discussions or start one of your own*

▶ **STAY CONNECTED**

twitter.com/niweek
Broadcast brief messages to colleagues and other attendees from your laptop or mobile phone and receive valuable conference information from NI staff. Remember to type #niweek in your tweet to send updates to the entire NIWeek community on Twitter. You can also follow @NIglobal or @LabVIEW on Twitter.

facebook.com/niweek
Want to be friends? Stay up to date on conference news, participate in polls, and connect with other NIWeek attendees by "liking" NIWeek on Facebook. You can also connect with fellow developers on our LabVIEW page or get company news and resources from our National Instruments page.

youtube.com/niglobal
View videos contributed by NI staff and other NIWeek attendees of cool product demonstrations from the NIWeek exhibition as well as interviews with NI leadership and industry experts.

bit.ly/NILinked
Make a lot of new contacts at NIWeek? Build your network of connections on LinkedIn and exchange information, ideas, and professional opportunities.

gowalla.com
Add the NIWeek icon to your Gowalla passport when you check in at the Austin Convention Center and let your network know you're at NIWeek.

EVENING ACTIVITIES

NIWeek KICKOFF HAPPY HOUR

Kick off your NIWeek experience with an evening of drinks and music while networking with NI sales engineers, National Instruments Alliance Partners, the NI R&D team, LabVIEW Champions, exhibitors, and other NIWeek attendees.

Monday, August 1 ▸ 5:30–7:00 p.m. ▸ Exhibition Hall

NI COMMUNITY *BLOCK DIAGRAM* PARTY

Enjoy food, drinks, and music as you meet fellow conference attendees from around the world. Watch the Challenge the Champions contest in the Technology Theater, participate in the third annual Expo Floor Scavenger Hunt starting at the Connect @NIWeek Lounge, or play with robots and meet robotics mentors who want to make a difference in the engineering industry.

Tuesday, August 2 ▸ 5:00–7:00 p.m. ▸ Exhibition Hall

ANNUAL NIWeek CONFERENCE PARTY

Don't miss out on an opportunity to attend a real Texas party! Enjoy Tex-Mex cuisine and cold drinks as you relax and hang out with new friends. Dance the night away to great music or kick back and network with your peers at this popular conference event.

Transportation provided.

Wednesday, August 3 ▸ 7:00–10:30 p.m. ▸ Austin City Limits – The Moody Theater

NOT SURE WHAT THESE BOXES ARE?

1. Download the app
You can read mobile bar codes using a smartphone camera. Search "QR reader."

2. Scan the code
Open the app and hold your phone over the bar code. The app uses your camera to read the code.

3. See something new
The bar code directs your phone to a YouTube video we think you should see.

NETWORKING ACTIVITIES

TEXAS DAY AT NIWeek

Texas Day gives engineering professionals around the state the opportunity to network with more than 3,000 engineers and scientists. Learn from today's leading innovators through a variety of interactive technical sessions, panel discussions, and hands-on and case study presentations for beginners and advanced developers. Join fellow Texans at a special luncheon to discuss application challenges and successes. Meet your local NI field engineers and NI Alliance Partners, and discover how you can use NI products to advance your application and retain your competitive advantage.

Tuesday, August 2 ▸ 8:00 a.m.–7:00 p.m. ▸ Austin Convention Center
Luncheon from 11:30 a.m. to 1:00 p.m. in the Exhibition Hall Café.

PEER2PEER ROUNDTABLES

Extend your network and expand your expertise by taking a lunch break with your peers and NI developers to discuss best practices and challenges within your application, job position, or industry. Grab lunch and meet at the designated tables in the dining area of the Exhibition Hall at noon.

Tuesday, August 2 Noon–1:00 p.m.	Table 1	Write-In Topic – Table's Choice
	Tables 2 and 3	NI LabWindows™/CVI Developers
	Tables 4 and 5	RIO Developers
	Tables 6 and 7	LabVIEW Developers
Wednesday, August 3 Noon–1:00 p.m.	Table 1	One-Stop Shop for NI and Partner Products: Can the Experience of Purchasing From NI Be Like Amazon or Apple?
	Tables 2 and 3	NI TestStand Developers
	Tables 4 and 5	Write-In Topic – Table's Choice
	Tables 6 and 7	LabVIEW Developers
Thursday, August 4 Noon–1:00 p.m.	Table 1	Write-In Topic – Table's Choice
	Tables 2 and 3	LabVIEW Developers

SPECIAL EVENTS

In addition to a variety of technical sessions, NIWeek gives you multiple opportunities to meet industry and academic leaders, learn about engineers in the NI Community, and enhance your product knowledge and expertise during the following special events:

BIG PHYSICS SYMPOSIUM

The Big Physics Symposium brings together scientists and researchers from major labs around the world and specialized vendors to share success stories, challenges, and new technologies. Join other engineers and scientists in networking and learning best practices and instrumentation strategies that can be applied in control, measurement, and diagnostics.

KEYNOTE

Adapting the Accelerator Control System – How Do We Meet the Demands?

Modern control systems for accelerator facilities are keystones for advanced accelerator operation. Various control frameworks on the three-tier standard model are successfully handling device signals and beam operation commands for daily operation. At SPring-8, we face high-throughput digital data handling from the 2D image detectors of the X-ray free electron laser facility, SACLA.

Ryotaro Tanaka, Director of Controls and Computing Division, JASRI/SPring-8

Monday, August 1 ▸ 8:30–9:00 a.m. ▸ Room 8 A/B/C

TECHNICAL SESSIONS

Putting NI Platforms to the Test: Quality Systems and Services

From design to manufacturing to hardware and software maintenance, NI has multiple quality initiatives that are independently implemented and monitored by the quality team. Discuss relevant initiatives, outcomes, and progress including investments in the design of redundancy capabilities and testing in the NI reliability lab. Also examine specialty testing of NI products under harsh conditions such as radiation.

Andy Krupp, Vice President of Quality and Continuous Improvement, NI

Monday, August 1 ▸ 9:00–9:30 a.m. ▸ Room 8 A/B/C

High Reliability and Availability Systems for Control Needs

The Large Hadron Collider (LHC) collimation systems at CERN have strict reliability and availability requirements to ensure LHC operation safety and to operate the accelerator without interruptions. Examine the methodology and results of a comparative study based on reliability and availability of the PXI and VME platforms.

Alessandro Masi, Senior Control Engineer, CERN

Monday, August 1 ▸ 9:30–10:00 a.m. ▸ Room 8 A/B/C

BIG PHYSICS SYMPOSIUM

Control and Data Acquisition System Architecture at NDCX-II

The Neutralized Drift Compression Experiment facility (NDCX-II) is a new induction linear accelerator under construction at Lawrence Berkeley National Laboratory. Learn about this machine, which will be able to produce intense, short pulse ion beams for heating matter uniformly and will create high energy density plasma for heavy ion fusion research, and how LabVIEW is used for control and data acquisition.

Matt Stettler, Senior Engineer, Lawrence Berkeley National Labs

Monday, August 1 ▸ 10:30–11:00 a.m. ▸ Room 8 A/B/C

Application of an FPGA-Based System as a Low-Noise Beam Current Monitor With Fast Machine Protection

A CompactRIO system with a digitizer and fast digital I/O modules measures beam currents of around tens of microamperes at the SNS momentum dump. Learn how LabVIEW FPGA provided a quick and integrated way to implement necessary calculations at high speed without requiring a team of developers.

Willem Blokland, Senior Beam Instrumentation Engineer, Oak Ridge National Laboratory

Monday, August 1 ▸ 11:00–11:30 a.m. ▸ Room 8 A/B/C

Orbit Correction System for the Brazilian Synchrotron Light Laboratory

The Brazilian Synchrotron Light Laboratory (LNLS) is testing a new and faster orbit correction system. It uses a distributed architecture based on a central PXI controller and 12 CompactRIO chassis connected through an EtherCAT network. Learn about the system architecture and the test results.

Daniel de Oliveira Tavares, Controls Engineer, and
Sergio Rodrigo Marques, Engineering Manager, LNLS

Monday, August 1 ▸ 11:30 a.m.–12:00 p.m. ▸ Room 8 A/B/C

ITER Fast Plant Controller System Prototype Based on the PXI Express Platform

The ITER CODAC design identifies slow and fast plant system controllers (PSC). The fast PSCs are based on embedded technologies, permit sampling rates greater than 1 KHz, meet stringent real-time requirements, and will be devoted to data acquisition tasks and control purposes. CIEMAT and UPM have implemented a prototype of a fast PSC based on commercial off-the-shelf (COTS) technologies with PXI hardware and software based on EPICS.

Jesus Varga, Director, CIEMAT

Monday, August 1 ▸ 1:30–2:00 p.m. ▸ Room 8 A/B/C

COTS Instrumentation for Advanced Steady-State Data Acquisition and Storing System

LHD is a superconducting fusion experimental device that demonstrates steady-state plasma operation. High-performance, steady-state data acquisition is enabled for more than one hour and each node acquires 110 MB/s of data using general-purpose data acquisition hardware. Examine how several NI PXI data acquisition (DAQ) modules are used for device/environmental monitoring.

Hideya Nakanishi, Associate Professor, National Institute for Fusion Science

Monday, August 1 ▸ 2:00–2:30 p.m. ▸ Room 8 A/B/C

Mitigation of Optic Flaws for the NIF Laser

The Optics Mitigation Facility (OMF) is a part of the Optics Processing Loop in support of the National Ignition Facility (NIF) at Lawrence Livermore National Labs (LLNL). Fused silica optics are some of the key components that direct and focus the laser beam. The high fluence of the laser light exposes flaws on the surface of the optic and inside its bulk. OMF uses LabVIEW to automate inspection and fix flaws to extend the life of the high-value optics.

Michael Flegel, Lab Systems Team Lead, and
Glenn Larkin, Engineer, LLNL

Monday, August 1 ▸ 2:30–3:00 p.m. ▸ Room 8 A/B/C

BIG PHYSICS SYMPOSIUM

Data Acquisition System Based on NI COTS for Pixel Sensors Characterization in Beam Test

Monolithic Active Pixel Sensors (MAPS) developed at the Institut Pluridisciplinaire Hubert Curien (IPHC) for future vertex detectors in high-energy physics require fast, reliable, and scalable data acquisition. Handling serial links at 160 MHz on proprietary protocols and sustaining throughput up to a few gigabytes per second is required. Examine the solution built around NI COTS that will be deployed in the EUDET Beam Telescope (DESY – CERN) as an upgrade to the former VME system.

Gilles Claus, Test Engineer, IPHC

Monday, August 1 ▸ 4:00–4:30 p.m. ▸ Room 8 A/B/C

Drift Tube Linac Cooling System Simulator/Tester

The Los Alamos Neutron Science Center (LANSCE) accelerator's Drift Tube Linac (DTL) water cooling circuits at Los Alamos National Labs (LANL) are being upgraded after more than 40 years in operation. CompactRIO with LabVIEW and EPICS have been selected for the new control system. Learn about the DTL simulator/tester – a computerized data acquisition and test system using PXI modules and NI VeriStand to supply and receive signals to mimic transducer control signals and monitor status components for the developmental water loop test stand and the actual water cooling circuit's installation.

Jack Gioia, Engineer, LANL

Monday, August 1 ▸ 4:30–5:00 p.m. ▸ Room 8 A/B/C

POSTER SESSION

▸ Computer Controls for the Weak Interaction Trap for Charged Particles (WITCH) Experiment at ISOLDE/CERN, **Ashish Naik,** NI United Kingdom

▸ Controlling a USB Haptic Controller for a Real-Time Application With CompactRIO, **Matt Brown,** LANL

▸ Diagnostics and Pulsed Power Systems Using General-Purpose Hardware, **Tim Ziemba,** Eagle Harbor Technologies

▸ Magnet Power Supply Annunciator and Control Interface Based on NI Single-Board RIO, **Stan Cohen,** BiRa

▸ Network Architectures for Large-Scale System Integration While Maintaining Performance, **David Scheibenhoffer,** Real-Time Innovations

▸ Reducing Stepper-Motor Drive Noise, **Mike Gruchalla,** LANL

▸ Tailoring the Hardware to Your Control System, **Scott Brown,** LANL

Monday, August 1 ▸ 3:00–4:00 p.m. ▸ Room 8 A/B/C

ACADEMIC FORUM

The Academic Forum provides a platform for academic professionals to share best practices in engineering education methods, discuss the future of engineering, and network with colleagues. View presentations from experts in engineering application areas, and learn how they integrate NI solutions to reinforce concepts and bring learning objectives to life.
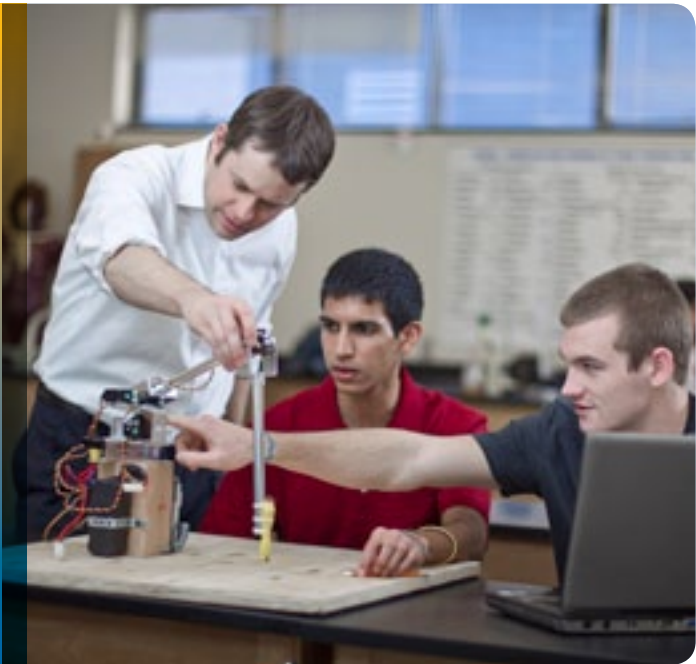
KEYNOTE

The Future of Engineering Education

Join Dave Wilson, NI director of academic and corporate marketing, as he discusses the future of engineering education and the innovative technologies that are required to effectively prepare students for the grand challenges of tomorrow.

Dave Wilson, Director of Academic and Corporate Marketing, NI

Monday, August 1 ▸ 11:30 a.m.–1:00 p.m. ▸ Ballroom A

TECHNICAL SESSIONS

Waterloo Labs Showcase

Four NI summer interns have been building low-cost projects and sharing them with the world over YouTube to the delight of the student, hobbyist, and tinkerer communities. Meet the team and see what they have been up to, what challenges they faced, and how they pulled off these projects.

Hunter Smith, Engineer, NI

Monday, August 1 ▸ 9:00–9:30 a.m. ▸ Ballroom C

LabVIEW Student Design Competition Finalists

Learn about the LabVIEW Student Design Competition finalists and discover how teams incorporated LabVIEW and graphical system design to tackle socially relevant engineering challenges.

Mark Walters, Academic Program Manager, NI

Monday, August 1 ▸ 9:30–10:00 a.m. ▸ Ballroom C

GLOBAL LabVIEW STUDENT DESIGN COMPETITION

See how brilliant engineering students from around the world are incorporating LabVIEW software into a variety of design projects at the Academic Forum. Students who participate have the opportunity to show off their expertise and enter to win cash prizes and trips to NIWeek. From inexpensive medical devices to complex underwater autonomous vehicles, students are engineering a better world using LabVIEW system design software. The possibilities are endless, so encourage your students to submit their design project into the 2012 competition. Learn more and browse 2011 student projects at **ni.com/studentdesign**.

ACADEMIC FORUM

LabVIEW Robotics Starter Kit (DaNI) Lab Exercises

DaNI is a preassembled robot that uses LabVIEW and existing libraries to quickly create a moving, sensing robotic vehicle. Students can focus more on learning various robotics concepts such as obstacle avoidance, localization, and path planning. Learn about the development of these lab exercises and the results of the first class that used them, and view a demo of the exercises.

Meghan Kerry, Product Manager, NI
James Conrad, Professor, UNC Charlotte

Monday, August 1 ▸ 9:30–10:30 a.m. ▸ Ballroom B

Biomedical Engineering: Measurements to Design

The University of Michigan biomedical engineering program has created a measurements-to-design sequence of courses to train students on LabVIEW in the measurements course and help them create solutions for the medical school in their senior design and masters design courses.

Sherman Fan and **Aileen Huang-Saad**, Professors, University of Michigan, Ann Arbor

Monday, August 1 ▸ 10:30–11:30 a.m. ▸ Ballroom C

Incorporating NI myDAQ Exercises in Electrics Circuits Courses

Learn about a series of exercises used with NI myDAQ and LabVIEW software in the introductory circuits class at Texas Tech University. The long-term goal is to integrate the devices throughout the curriculum, beginning with the introductory course in the freshman year.

Catherine Chesnutt and **Mary C. Baker**, Professors, Texas Tech University

Monday, August 1 ▸ 10:30–11:30 a.m. ▸ Ballroom B

Control With CompactRIO

The mechanical engineering department at Purdue University uses CompactRIO to teach students about control theory. The course influenced the senior design and measurements course and the equipment is being looked at as a model teaching tool for controls in other departments such as aerospace engineering.

Galen King, Professor, Purdue University

Monday, August 1 ▸ 1:00–1:30 p.m. ▸ Ballroom C

In-Class Experiments Using NI myDAQ and LEGO® MINDSTORMS® NXT for Lecture-Based Courses

Traditional lecture-based courses provide a passive learning environment for students. Explore in-class labs that were developed for standard 50-minute lectures, and discuss three NI myDAQ experiments. Also examine an experiment that uses the LEGO MINDSTORMS NXT with LabVIEW for an introductory controls course.

Bonnie Ferri, Professor, Georgia Tech

Monday, August 1 ▸ 1:00–1:30 p.m. ▸ Ballroom B

Haptics-Controlled Robotics

Dr. Zadeh has created haptic-controlled robots using the DaNI platform. The course has produced novel designs for robots and is influencing choices being made in first-year engineering, robotics, and vehicle electrification courses.

Mehrdad Zadeh, Professor, Kettering University

Monday, August 1 ▸ 1:30–2:00 p.m. ▸ Ballroom C

Using NI ELVIS, Multisim, LabVIEW, and NI myDAQ in Electronic and Electrical Engineering

Learn how the University of Manchester incorporates hands-on learning throughout the curriculum. Using the National Instruments Educational Laboratory Virtual Instrumentation Suite (NI ELVIS), NI myDAQ, Multisim, and LabVIEW, Dr. Danielle George discusses how students implemented a dynamic learning environment for students in the lecture course, in the laboratory, and off campus.

Danielle George, Professor, University of Manchester

Monday, August 1 ▸ 1:30–2:00 p.m. ▸ Ballroom B

Local Industry Helps Shape LabVIEW Certification Program

Learn how collaborating with local companies helped shape a LabVIEW certification program offered at the University of Wisconsin-Eau Claire. The program consists of three LabVIEW courses in parallel with two electronics courses over two semesters. Topics and homework exercises are drawn from LabVIEW projects with local companies. Students take the CLAD exam after the final LabVIEW course.

Kim Pierson, Professor, University of Wisconsin-Eau Claire

Monday, August 1 ▸ 2:30–3:00 p.m. ▸ Ballroom B

ACADEMIC FORUM

Teaching Mechatronics for a Mechanical Engineering Senior Capstone Design Class

The basic functions of mechatronics systems consist of customizable functions, human interactions, physical layer interfaces, and real-time system realization. Learn about a new mechanical engineering senior capstone design class at UCLA that introduces computer hardware/software and real-time systems and includes four-hour laboratory sessions to implement cruise control and adaptive cruise control for the LabVIEW Robotics Starter Kit using the LabVIEW Real-Time, LabVIEW FPGA, and LabVIEW Statechart modules.

Tsu-Chin Tsao, Professor, University of California, Los Angeles

Monday, August 1 ▶ 2:30–3:00 p.m. ▶ Ballroom C

Explorative Learning Using NI myDAQ Through an Electrical Engineering Curriculum

Penn State is creating an electrical engineering curriculum that uses NI myDAQ for hands-on learning. Explore how NI myDAQ, along with Multisim and LabVIEW, will be used in the circuits series, junior design, controls, and senior design courses.

Jeffrey L. Schiano, Professor, Penn State

Monday, August 1 ▶ 3:00–3:30 p.m. ▶ Ballroom B

LabVIEW, the NI USRP, and Implications for Software-Defined Radio

With the new universal hardware driver (UHD) and related support for Windows and LabVIEW, the NI universal software radio peripheral (USRP) offers a scalable and simpler platform. This support broadens the accessibility of the USRP platform for teaching applications and will spur further adoption within communication systems classrooms, teaching laboratories, and coursework. Explore the use of virtual instrumentation based on LabVIEW with the USRP and a UHD-based software driver to rapidly create real-time communication systems demonstrations for the classroom and laboratory settings.

Sachin Katti, Professor, Stanford University

Monday, August 1 ▶ 3:00–3:30 p.m. ▶ Ballroom C

Controls Curriculum Based on NI myDAQ for College Freshman and High School Students

Examine a series of modules using NI myDAQ to teach students about robotics and control systems as early as their freshman year. The modules focus on engaging students, rather than the underlying science.

Alexander Leonessa, Assistant Professor, Virginia Tech

Monday, August 1 ▶ 4:00–4:30 p.m. ▶ Ballroom C

Using CompactRIO to Teach Renewable Energy Concepts

Learn how United Arab Emirates (UAE) University is incorporating graphical system design to teach and reinforce key green engineering concepts such as building integrated photovoltaic systems. Explore how students build a real-world replica of a house and use technologies such as CompactRIO with LabVIEW to monitor photovoltaic arrays for performance and fault detection.

Dr. Ali Assi, Professor, UAE University

Monday, August 1 ▶ 4:00–4:30 p.m. ▶ Ballroom B

Engineering Education Panel Discussion

Join leading experts in engineering education in a panel discussion on the challenges that face our colleges and universities in both research and teaching. Topics include enrollment, engagement, retention, funding, and teaching technology.

Presented by Engineering Education Experts

Monday, August 1 ▶ 4:30–5:30 p.m. ▶ Ballroom A

ACADEMIC FORUM – UT LAB TOURS

Tour some of the cutting-edge labs at The University of Texas at Austin to see work in various application areas and how NI technology is used to further academic research.

Mechanical Engineering
Mechatronics and Advanced Mechatronics Labs

The undergraduate Mechatronics Laboratory provides hands-on experience using hand-held and bench-top electronic test and prototyping equipment, including NI ELVIS for circuits and mechatronics applications; computer-aided instrumentation and data acquisition using LabVIEW; laboratory study in design using Multisim; and prototyping and testing with electrical and electronics components and electromechanical devices. Senior and graduate mechanical engineering students may elect to take Introduction to Mechatronics II, which covers interfacing microcomputers with sensors and actuators, hybrid (analog/digital) design, digital logic and analog circuitry, data acquisition and control, microcomputer architecture, assembly language programming, signal conditioning, filters, and analog-to-digital and digital-to-analog conversion.

Electrical and Computer Engineering
Wireless Networking and Communications Group

The Wireless Networking and Communications Group (WNCG) is an interdisciplinary center for research and education in wireless networking, communications, and related industry applications. The Wireless Communications lab course takes an experimental approach to wireless digital communication. Theory in the classroom is translated directly into practice with the help of the NI PXI RF platform and LabVIEW Modulation Toolkit. Labs are currently being developed using the NI USRP platform as well. The emphasis is on physical layer concepts rather than implementation considerations. Specific topics covered in this course include bandwidth, sampling, complex baseband equivalent representation, upconversion, downconversion, narrowband signals, channel estimation, and principles of software-defined radio.

Electrical and Computer Engineering
Introduction to Electrical Engineering

As a course for first-semester freshman electrical and computer engineering students, it covers the scope and nature of professional activities of electrical engineers, including problem-solving techniques; analysis and design methods; engineering professional ethics; analysis of analog resistive circuits, including Thevenin/Norton equivalents, mesh analysis, and nodal analysis; and operational amplifiers (DC response). Recently, the lab section of the course adopted NI myDAQ, LabVIEW, and Multisim as the primary tools used by students. Each student purchases their own NI myDAQ and uses it in a series of courses during their undergraduate program. Example labs performed by students will be demonstrated.

Tour participants should meet in the registration area for transportation at 8:30 a.m.

Monday, August 1 ▶ 8:30–11:15 a.m. ▶ The University of Texas at Austin

COMMUNITY EXCHANGE

The Community Exchange showcases new web technologies and connects you to innovative thought leaders. Network with colleagues and members of the NI Community during these interactive sessions that feature the business side of the community, community member highlights, and the LabVIEW Add-On of the Year.

5 Tips for a Successful User Group

Learn the top five tips that can make your LabVIEW user group even better and how you can connect to fellow LabVIEW programmers in your area. Whether you are in a user group now, looking for one in your area, or wanting to start your own, these tips will arm you with information to take your LabVIEW knowledge and networking power to the next level.

Grant Heimbach, LabVIEW Product Manager, NI
Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 10C

The Business Side of Social: Put the LabVIEW Community to Work for You

The LabVIEW ecosystem offers a wealth of "social media" resources – so many that it can sometimes be hard to find the technical information you really need. Learn secrets on how to get a great return on time invested in the LabVIEW Community and how to equip yourself with online tools that give you the inside scoop on the latest engineering techniques to keep you at the top of your game.

Jack Dunaway, Engineer, James Kring Inc. (JKI)
Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 10C

We Are the Champions

Do you have dreams of becoming a LabVIEW Champion? Learn from the top LabVIEW Community members who are recognized for their leadership, expertise, and contributions to the technical community. LabVIEW Champions are credible technology experts from around the world who inspire others to learn and grow with LabVIEW.

Grant Heimbach, LabVIEW Product Manager, NI
Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 10C

2011 LAVA/OpenG NIWeek BBQ

This yearly event brings together the best online and real-world friends from the LAVA and OpenG online forums and LabVIEW R&D. Step away from the hustle and bustle of the NIWeek expo floor and enjoy great barbecue with great people. Tickets are $30 USD per person. Learn more at **lavag.org/bbq**.

Tuesday, August 2 ▸ 7:00 p.m. ▸ Scholz Garten – 1607 San Jacinto Blvd, Austin, Texas 78701

COMMUNITY EXCHANGE

How to Create Engaging NI Community Groups

Learn how to navigate the NI Community, create documents, and build an engaging community group page. Take a high-level look at the many different document types and widgets you can use to be more efficient within the NI Community.

Vu Doan, Community Program Manager, NI
Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 10C

Practical Examples of LabVIEW OOP Classes and Use Cases

Examine practical LabVIEW object-oriented programming (OOP) class definitions and their uses in real-world applications; design considerations for the class definitions; and inheritance, dynamic dispatch, and effective use of public and private methods. Examples include a family of logging classes, a general-purpose communication class, and an interprocess messaging system.

Mark Yedinak, Engineer, Zebra Technologies Corporation
Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 10C

Panel Discussion: Get Support and Get Skilled Online Through a Community of Peers

Keeping your development projects moving forward and finding the best approach to solve your problems is critical for your business. The online community platforms provided on **ni.com** and through social media outlets offer immense resources for technical support, collaboration, and deep technical reference material. Hear about the well-known and lesser-known options for getting skilled and getting support online, and catch a glimpse of where we're taking web support in the future. Attend this open forum and share your questions, ideas, and feedback.

John Pasquarette, Vice President of eBusiness,
Laura Feeney, Web Support Program Manager,
Vu Doan, Community Program Manager,
Claire Reid, Community Project Manager, and
Andria Elliott, Social Media Program Manager, NI
Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 10C

The Missing Link

Nearly 9 million engineers use LinkedIn to network, exchange information, and learn about new opportunities. Discover three reasons why you should join LinkedIn and make it a part of your regular routine. Also learn how to use the LinkedIn platform to increase your professional reputation and add value to the engineering community.

Rod Siebels, Regional Marketing Communications Manager, NI
Terry Stratoudakis, Executive Director, Wall Street FPGA LLC
Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 10C

Creating a Software Evaluation for Your Product in 10 Minutes

Quickly and efficiently implement licensing using LabVIEW. Learn how to create an activation trial period for your product built with LabVIEW.

David Ladolcetta, Partner Program Engineer, and
Will Schoettler, LabVIEW Tools Network Product Manager, NI
Wednesday, August 3 ▸ 2:15–2:45 p.m. ▸ Room 10C

LabVIEW Add-On of the Year

View in-depth product demonstrations from the LabVIEW Add-On of the Year finalists and winner. Also gain an overview of the Compatible with LabVIEW program guidelines and benefits.

Will Schoettler, LabVIEW Tools Network Product Manager, and
Jeff Meisel, LabVIEW Partner Program Manager, NI
Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 10C

5 Clever Debugging Techniques for Every LabVIEW Developer

Do you want to be a LabVIEW bug assassin? Do you want to identify, isolate, and fix bugs faster than your coworkers by using clever tricks? Learn several powerful built-in LabVIEW debugging techniques ranging from simple tools like retain wire values to the best LabVIEW debugging feature that no one knows about.

Omar Mussa, Engineer, JKI
Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 10C

THE FUTURE OF SYSTEM DESIGN SYMPOSIUM

This new symposium brings together leading researchers, industry suppliers, and designers to explore the future of system design. Learn about the latest system design technologies and research including processors and FPGA convergence, high-level synthesis tools and flows, and approaches for increasing design productivity.
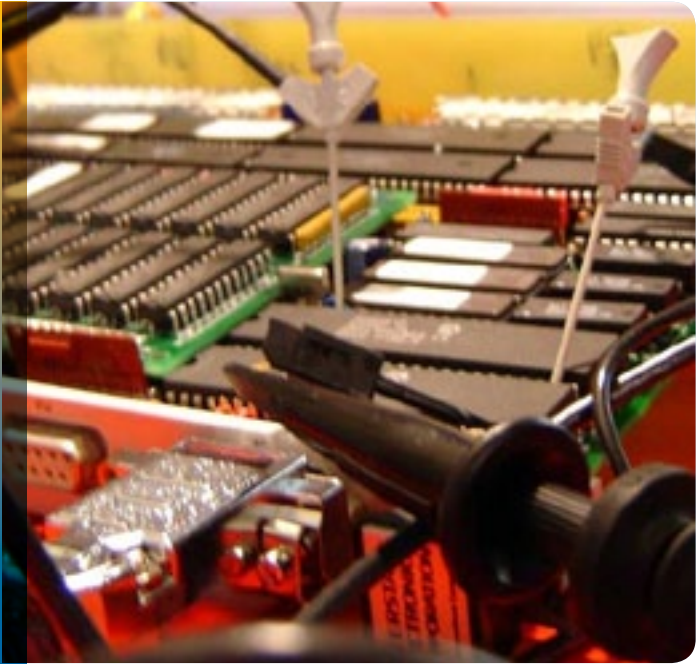
KEYNOTE

The Future of System Design

Learn about some of the critical hardware innovations transforming the landscape of system design that present opportunities for innovation as well as significant challenges for software development. Discuss how processor and FPGA technologies are converging to provide new functionality as well as how hardware and software design tools must adapt to these new advances.

Ivo Bolsens, CTO and Senior Vice President, Xilinx

Tuesday, August 2 ▶ 10:30–11:30 a.m. ▶ Room 3

TECHNICAL SESSIONS

Increasing FPGA Design Productivity

Configurable computing machines based on FPGAs are touted as reusable, reconfigurable platforms for accelerated computing, but the time-consuming FPGA compilation process limits designer productivity. Discuss a novel approach using previously synthesized, placed, and routed circuits called "hard macros" that enable rapid design assembly. Learn how this approach shortens compilation time by 10 to 50 times over the conventional approach and find out how it could be applied to LabVIEW FPGA applications.

Brent Nelson, Codirector of the NSF Center for High-Performance Reconfigurable Computing, Brigham Young University (BYU)

Tuesday, August 2 ▶ 1:00–1:30 p.m. ▶ Room 3

Using Cutting-Edge Tools for DSP and Streaming System Design

Digital signal processing (DSP) and streaming systems are naturally modeled using rigorous, formal models of computation such as synchronous dataflow graphs that are conducive to static analysis and optimization techniques. However, mapping such descriptions into tightly constrained real-time implementations requires optimizing resource sharing, buffering, and scheduling across a multidimensional latency-throughput-area objective space. Explore new approaches to these design trade-offs to achieve a successful system design.

Andreas Gerstlauer, Assistant Professor, UT Austin

Tuesday, August 2 ▶ 1:30–2:00 p.m. ▶ Room 3

Designing an Advanced Flight Controller for Harvesting Airborne Wind Energy

Windlift needed to create an embedded flight controller to maximize stability of a power-generating flexible airfoil during development of a mobile wind energy platform. Learn how the team solved this challenge with LabVIEW and CompactRIO. See how processing tasks were partitioned between the embedded real-time software and FPGA hardware to maximize performance and efficiency.

Matt Bennett, Vice President of R&D, Windlift

Tuesday, August 2 ▶ 2:15–2:45 p.m. ▶ Room 3

The Promise and Challenge of High-Level Synthesis for System Design

For more than 20 years, researchers and vendors have attempted to significantly lower the barrier to system design by enabling the use of high-level languages for hardware design. These attempts at high-level synthesis have had limited success, but they have shown the potential to solve complex design challenges. Discuss why high-level synthesis technology is needed, the challenge of providing an effective solution, and why the adoption tipping point may be coming very soon.

Randy Allen, Chief Architect, NI

Tuesday, August 2 ▶ 2:45–3:15 p.m. ▶ Room 3

From Concept to Completion – Incorporating Test as an Integral Part of a Model-Driven System Design Process

System design teams can realize significant and measurable improvements in time to certification, time to market, quality, and costs using a model-driven development flow and including test considerations as a first-class element of the system design process. For the system engineer, a model-driven tool flow provides a virtual environment for complete system engineering. For the test engineer, a model-driven tool flow provides a virtual environment for test development. Examine how the SystemVision/SVX virtual prototyping platform, integrated with LabVIEW, is used to develop systems and test them early in the design cycle.

Darrell Teegarden, Director of System Modeling and Analysis, Mentor Graphics

Tuesday, August 2 ▶ 3:30–4:00 p.m. ▶ Room 3

The Future of System Design With LabVIEW

Explore how the LabVIEW platform will take on future system design challenges imposed by the rapidly changing hardware and software landscape. Learn about the vision that is propelling LabVIEW into the design space and the ideas and research that are transforming this engineering tool into a world-class system design solution.

David Fuller, LabVIEW Platform Director, NI

Tuesday, August 2 ▶ 4:00–4:30 p.m. ▶ Room 3

Experts Panel: The Next Decade of System Design

Participate in an interactive discussion with seasoned industry and academic experts as they predict the trajectory of design challenges and the potential solutions available to system designers over the next 10 years.

James Truchard, President, CEO, and Cofounder, NI
Brent Nelson, Codirector of the NSF Center for High-Performance Reconfigurable Computing, BYU
Ivo Bolsens, CTO and Senior Vice President, Xilinx
Jan Rabaey, Codirector of the Berkeley Wireless Research Center, University of California, Berkeley

Tuesday, August 2 ▶ 4:45–5:45 p.m. ▶ Room 3

• GRAPHICAL SYSTEM DESIGN •
Achievement Awards

The Graphical System Design Achievement Awards recognize the most innovative user applications based on NI software and hardware. This year more than 305 authors from around the world submitted technical papers that depict their greatest achievements in graphical system design. Visit the contest poster display, located outside Ballroom D, to learn about the finalist's applications for each of the eight application categories. Winners of each category as well as the recipients of several featured awards – including Community's Choice, Green Engineering, Humanitarian, Editor's Choice, LabVIEW FPGA Innovation sponsored by Xilinx, and the 2011 Application of the Year – will be announced at the invitation-only awards dinner on Tuesday, August 2.

ACADEMIC RESEARCH

▸ Implementing FPGA-Based Feedback Control of a Single Atom Trajectory With LabVIEW and NI FlexRIO

By Christian Sames, Alexander Kubanek, Markus Koch, Matthias Apel, Maximilian Balbach, Karim Murr, and Gerhard Rempe – Max-Planck Institute

By Alexei Ourjoumtsev – Institut d'optique

By Pepijn W. H. Pinkse – MESA+ Institute for Nanotechnology, Germany

▸ Using LabVIEW and PXI to Measure the Temperature and Density of Fusion Plasmas on a Tokamak COMPASS

By M. Aftanas, P. Bilkova, P. Bohm, V. Weinzettl, M. Hron, and R. Panek – Institute of Plasma Physics

By J. Bongaarts and R. Stefan – National Instruments

By T. Wittassek, M. Rumpel, J. Sima, and D. Kaminsky – Elcom, Czech Republic

ADVANCED CONTROL SYSTEMS

▸ Positioning Actuators for the European Extremely Large Telescope Primary Mirror With LabVIEW and PXI Hardware

By Sorin Grama – Promethean Power Systems, USA

▸ Developing a Solar-Powered Milk Chiller With LabVIEW and NI Single-Board RIO

By Miguel Núñez, Yolanda Martín, Marcos Reyes, and Teodora Viera – Instituto de Astrofísica de Canarias, Spain

▸ Powering Remote Villages With Revolutionary Airborne Wind Technology Using CompactRIO

By Matt Bennett – Windlift, USA

AUTOMATED TEST

▸ Texas Instruments Increases Firmware Test Platform Throughput, Coverage, and Reliability With NI Hardware and Software

By Sambit Panigrahi and Shirish Kavoor – Texas Instruments, USA

▸ Using NI FlexRIO to Develop a Cost-Effective Solution for 3D and HD Video Test

By Mauro Arigossi – Alfamation, Italy

EDUCATION

▸ MIT Students Use LabVIEW and CompactRIO to Design and Implement a Dynamic Output Feedback Controller

By Jonathan How, Emilio Frazzoli, and Brandon Luders – Massachusetts Institute of Technology, USA

▸ Using LabVIEW, CompactRIO, and PXI to Study Renewable Energy Sources

By Prof. dr. sc. Nedjeljko Perić and Prof. dr. sc. Željko Ban – University of Zagreb, Croatia

EMBEDDED MONITORING

▸ Creating a Distributed Wireless Monitoring System for Aircraft Noise

By Luis Pastor Sánchez Fernández, Luis A. Sanchez Pérez, and Sergio Suárez Guerra – Center for Computing Research, National Polytechnic Institute, Mexico

▸ Remotely Assessing the Structural Health of the LIRR Railroad Viaduct

By Brian Lander and Jim Campbell – Viewpoint Systems Inc.

By Dan Fridline – STRAAM Corporation, USA

LIFE SCIENCES

▸ Developing the World's First Real-Time 3D OCT Medical Imaging System With NI FlexRIO

By Dr. Kohji Ohbayashi, D. Choi, K. Shimizu, and H. Hiro-Oka – Kitasato University

By A. Kubota, T. Ohno, and R. Ikeda – System House Co., Japan

▸ Using NI FlexRIO to Develop a High-Speed, Compact OCT Imaging System

By Takuya Suzuki – Santec Corporation, Japan

ROBOTICS

▸ Simulation Software Improves Design Process for Robotic Manipulator

By Lisa Mosier – Square One Systems Design Inc., USA

▸ Developing a Leg-Wheel Hybrid Mobile Robot Using LabVIEW and CompactRIO

By Pei-Chun Lin, Shen-Chiang Chen, Ke Jung Huang, Shuan-Yu Shen, and Cheng-Hsin Li – Department of Mechanical Engineering, National Taiwan University, Taiwan

VALIDATION TEST

▸ Using LabVIEW, PXI, and CompactRIO to Rapidly Develop Structural Test Systems for a Space Exploration Vehicle

By Dave Baker – G Systems, USA

▸ Using CompactRIO and LabVIEW to Verify the Design and Test the Durability of a Wind Turbine Drive Train

By Morten Peterson – CIM Industrial Systems A/S

By Rasmus Vistisen – Vestas Wind Systems A/S, Denmark

SPECIAL EVENTS

Maximize your NIWeek conference experience by attending the following special events. Learn from industry leaders at the Industry Experts Panel where you have the chance to ask direct questions regarding trends in clean energy technology. At the Build Your Own Embedded System hands-on workshop, learn how to prototype an embedded system based on LabVIEW and NI hardware.

▶ **BUILD YOUR OWN EMBEDDED SYSTEM**

The Build Your Own Embedded System (BYOES) hands-on workshop, sponsored by Cyth Systems, focuses on prototyping an embedded system based on CompactRIO. Learn how to use the LabVIEW Real-Time and LabVIEW FPGA modules to build a fully configured and programmed CompactRIO embedded system and take it home after the conference. Preregister at **ni.com/niweek** or onsite at the Austin Convention Center depending on availability. The fee for this workshop is $500 USD.

Monday, August 1 ▶ 1:00–5:00 p.m. ▶ Austin Convention Center
Tuesday, August 2 ▶ 10:30 a.m.–3:15 p.m. ▶ Austin Convention Center

▶ **INDUSTRY EXPERTS PANEL**
THE SMART GRID WORLDWIDE: TODAY AND TOMORROW

Join smart grid industry leaders to gain an inside perspective on smart grid technology, including global trends in R&D investment, recent progress, and five-year road maps. Understand development and rollout plans for networked smart sensors and controls, electric vehicles, energy storage systems, and renewables. Also hear how a successful startup, XTreme Power, used graphical system design techniques to help bring their grid-level energy storage systems to market. The panel will be moderated by National Instruments Vice President of Global Energy Owen Golden and feature the following panelists:

Carlos Coe, President and CEO, Xtreme Power

Jim Greer, Senior Vice President of Asset Management and Engineering, Oncor Electric Delivery

Alison Silverstein, Project Director, North American SynchroPhasor Initiative (NASPI)

Wednesday, August 3 ▶ 3:30–4:30 p.m. ▶ Ballroom D

TRAINING AND CERTIFICATION

Maximize your NIWeek experience by supplementing conference sessions with training and certification exams. Offered at the Austin Convention Center, training and certification exams help advance and validate your development skills. Visit the NI Services and Training Booth to register for a certification exam.

▶ **TRAINING AND CONTINUING EDUCATION**

Gain in-depth product knowledge and learn best practices for developing applications by attending a two-day training course that begins two days prior to NIWeek. By taking each course, you can earn 1.4 CEUs to maintain a professional status such as Professional Engineer. The following courses are offered as two-day modules from Sunday, July 31, to Monday, August 1:

– *Object-Oriented Design and Programming in LabVIEW*
– *RF Application Development (condensed)*
– *Managing Software Engineering in LabVIEW*
– *TestStand II: Customization*
– *LabVIEW Real-Time 2*
– *LabVIEW Connectivity*

▶ **CERTIFICATION EXAMS**

Validate your skills by taking certification exams for LabVIEW, LabWindows/CVI, and NI TestStand. During NIWeek, you can take the one-hour Certified LabVIEW Associate Developer exam for only $99 USD and all other exams for $199 USD. In addition, you can take any of the one-hour recertification exams for a special price of $99 USD, including the new Certified LabVIEW Architect Recertification exam. Certification exam prep courses are offered at no cost.

CERTIFICATION EXAM PREP COURSES

	Room	August 1	August 2–August 4
Certified LabVIEW Developer (CLD)	Mz 6	8:30 a.m.–12:30 p.m.	
Certified LabVIEW Architect (CLA)	Mz 6	1:00–5:00 p.m.	

EXAM SCHEDULE

	Room	August 1	August 2–August 4
Certified LabVIEW Associate Developer (CLAD) Certified LabVIEW Architect Recertification (CLA-R) Certified LabVIEW Developer Recertification (CLD-R) Certified TestStand Architect (CTA) Certified TestStand Developer (CTD)	5C	1:30–2:30 p.m. 3:30–4:30 p.m.	10:30–11:30 a.m. 1:30–2:30 p.m. 3:30–4:30 p.m.
Certified LabVIEW Architect (CLA) Certified LabVIEW Developer (CLD) Certified LabWindows/CVI Developer (CCVID)	5B		1:00–5:00 p.m.

SUMMITS

ENERGY TECHNOLOGY SUMMIT

Creating sustainable energy to meet worldwide demand is one of the greatest economic opportunities of the 21st century.

30

ROBOTICS AND AUTONOMOUS VEHICLES SUMMIT

The proliferation of robotics is happening now; by 2020, robots will be part of everyday life from working in factories, construction, and maintenance to security, entertainment, and health care.

33

AEROSPACE AND DEFENSE SUMMIT

From factory to field and in-flight, COTS technology delivers vital test and data acquisition solutions, ensuring innovative and operable aviation and national security systems.

36

RF AND WIRELESS TEST SUMMIT

Increasing complexity in wireless devices requires test platforms to deliver fast, accurate, and flexible measurements from prototype to manufacturing.

38

VISION SUMMIT

From inspecting consumer goods to helping doctors perform eye surgery, vision technology is essential for improving productivity and performance in many industries.

40

ENERGY TECHNOLOGY SUMMIT

The theme for the Energy Technology Summit is *designing the smart grid*. Discuss smart grid technology, development techniques, and topics including renewable generation, storage, and electric vehicles. Network with smart grid pioneers and deepen your understanding of reconfigurable embedded system technologies based on LabVIEW that are pushing the boundaries of the smart grid.

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KEYNOTES

Bridging the Gap to the Smart Grid: State of the Union and Lessons Learned at CenterPoint

Hear how the third largest utility provider in the US is making the transition to a fully realized smart grid without sacrificing stable and reliable energy delivery. What's the status today, tomorrow, and in the future? What lessons has CenterPoint learned that will guide future smart grid strategies?

Kenny Mercado, Senior Vice President of Electric Operations, CenterPoint Energy

Tuesday, August 2 ▸ 10:30–11:00 a.m. ▸ Room 16B

Digital Power Transmission: The Future of Synchrophasor Measurement Technology

Join NASPI in helping advance the development, research, analysis, and deployment of networked synchrophasor technology. Phasor measurement units (PMUs) are precise, high-speed measurement systems distributed across the transmission grid to provide a comprehensive view of the entire interconnection, enabling real-time wide-area visualization of the grid, grid stress analysis, proactive corrective actions, and improved renewable resource integration.

Alison Silverstein, Project Director, NASPI

Tuesday, August 2 ▸ 11:00–11:30 a.m. ▸ Room 16B

Japan's Digital Grid: Realizing the Free Market Mechanism of the Electrical Grid

Electricity is not just "electricity." It holds several value factors such as cost, greenness, carbon dioxide credit, and time of use along with deliverables of those values to be considered. After identifying, tagging, and storing each electricity value/deliverable, electricity becomes a commodity. Unified measurement and control systems in power electronics using development technologies such as LabVIEW will play a significant role in this paradigm shift.

Rikiya Abe, Professor, University of Tokyo Socio-Strategic Engineering and Investment Laboratory

Wednesday, August 3 ▸ 11:00–11:30 a.m. ▸ Room 16B

ENERGY TECHNOLOGY SUMMIT

TECHNICAL SESSIONS

Embedded System Fundamentals for Smart Grid Sensing and Analytics

The proliferation of smart networked embedded systems throughout the grid will revolutionize the way electricity is produced, consumed, and distributed and act as a foundation for a clean energy future. Embedded smart instrumentation systems are the building blocks for monitoring, controlling, and automating transmission and distribution power systems. How do you design smart embedded systems capable of real-time processing, analytics, time synchronization, and network communication with the utility? How are synchrophasor measurement units implemented and programmed?

Chris LeBlanc, Member, Center for Commercialization of Electric Technologies
Roberto Piacentini, Global Technology Program Manager, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 16B

PMU Technology for Dynamic Conditions in Distribution

Although originally targeted at power transmission, PMU technology is evolving to handle dynamic grid conditions and is moving into distribution networks to improve operational practices in normal and emergency conditions. Learn about new NI products that give you powerful hardware and software building blocks. Hear from an experienced integrator of power analyzer systems about the top five field installation and deployment challenges and solutions.

Mario Paolone, Assistant Professor, University of Bologna
Daniel Kaminský, Division Director, ELCOM

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 16B

Under the Hood of Smart Grid, Microgrid, and Energy Storage Control Systems

Smart embedded systems that combine instrumentation, analytics, and control are the heart of smart grid technologies. Learn the fundamentals of smart grid control systems and gain inside perspective from developers with systems based on CompactRIO. Lockheed Martin, a pioneer in microgrid technology, Xtreme Power, a leader in utility-scale energy storage systems, and NI explain how they use LabVIEW Real-Time and LabVIEW FPGA to measure and control energy flow, storage, and generation.

Heather Schmidt, Power Management Team, Lockheed Martin
Richard Jennings, President, Jennings Embedded Services
Todd Walter, Senior Group Manager, NI

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 16B

Accelerating Development of Power Electronics Control Systems With RCP and HIL Techniques

The design and commercialization of grid-tied power electronics control systems was historically hampered by a lack of rapid control prototyping (RCP) and real-time hardware-in-the-loop (HIL) simulation capabilities. Learn about a host of new graphical system design tools and FPGA-based platforms that can dramatically accelerate development.

Dr. Bill Kramer, R&D Manager for Energy Systems Integration Technologies, National Renewable Energy Lab,
Dr. Ben Black, Systems Engineer, NI
David Farnia, Consultant, JMAG International

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 16B

ENERGY TECHNOLOGY SUMMIT

Implementing Advanced Distribution Systems With Reconfigurable Embedded Platforms

Learn about advanced distribution automated systems based on the NI Single-Board RIO embedded platform to track electricity flow and provide real-time grid information. These systems have a wide range of applications, from substation automatic meter reading and remote control of substation assets to transformer monitoring. Undergoing mass deployment in Rajasthan, India, it provides accurate grid monitoring to ensure uninterrupted power services to customers.

Jaswinder Singh, Project Manager, NexGEN Consultancy Pvt. Ltd.

Wednesday, August 3 ▶ 1:00–1:30 p.m. ▶ Room 16B

Overcoming Technical Challenges: Lessons Learned in Smart Distribution Systems Development

Hear about the technical lessons learned for the development and deployment of smart recloser and switch systems from both Siemens and CenterPoint perspectives.

Presented by Siemens, and
Jonathan Suda, Engineer, CenterPoint Energy

Wednesday, August 3 ▶ 1:30–2:00 p.m. ▶ Room 16B

Toshiba Railway Substation Energy Asset Monitoring Using CompactRIO

In Japanese railway substations, it is desirable to monitor a wide range of parameters and perform real-time load condition analysis. Toshiba standardized on CompactRIO because NI tools are the worldwide standard, provide tight synchronization technology over Ethernet, and offer connectivity with other devices including non-Toshiba product. This system supports the IEC 61850 electrical substation automation protocol and is connected to a SCADA system.

Nobuhiko Satake, Social Infrastructure Systems Specialist, Toshiba

Wednesday, August 3 ▶ 2:15–2:45 p.m. ▶ Room 16B

Facilitating Smart, Energy-Efficient Building Technology

Opportunities abound to reduce the substantial energy footprint of buildings through the application of emerging technologies that range from new materials to smart devices and appliances. Learn about the design of an advanced National Renewable Energy Lab research and testing facility and how to build software adaptable C Series networks to meet ever-changing sensing and instrumentation requirements.

Dane Christensen, Residential Building Systems Senior Engineer, National Renewable Energy Lab
Craig Eidson, General Manager, Optimation Technology Inc., Pecan Street Project

Wednesday, August 3 ▶ 2:45–3:15 p.m. ▶ Room 16B

Testing Energy Storage Systems: From EVs to Utility Scale

Explore the critical factors to consider when testing energy storage systems, such as isolation, noise, and simultaneous measurements. Hear lessons learned from testing and simulating systems ranging from electric vehicle (EV) battery packs to utility-scale (2 MW) grid storage systems.

Jonathan Murray, Project Manager, Bloomy Controls Inc.

Wednesday, August 3 ▶ 3:30–4:00 p.m. ▶ Room 16B

Electric Vehicle Simulation Techniques for Testing and Validation

Learn how the design, validation, and optimization of hybrid and electric vehicles are facilitated by new multidomain modeling tools that capture the dynamics of the motor, batteries, power electronic controls, suspension, tires, and more while simulating vehicle performance under a variety of operating conditions.

Jennifer Stack, Engineer, Tecnalia Corporation
Matthew Eurich, Vice President, Wineman Technology Inc.

Wednesday, August 3 ▶ 4:00–4:30 p.m. ▶ Room 16B

ROBOTICS AND AUTONOMOUS VEHICLES SUMMIT

The Robotics and Autonomous Vehicles Summit unites the world's top roboticists, researchers, design engineers, and domain experts working on design, simulation, prototyping, and deployment of robotics applications. With in-depth sessions and corresponding live demos at the Robotics Pavilion, learn how to apply the latest technology from real-time devices, FPGAs, and graphical programming to design robotics systems.

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KEYNOTES

Mobile Diagnostic Robot: Sense, Move, and Control

Robots for mobile testing are becoming more and more attractive due to their flexibility and multifunctionality. They provide an excellent way to move and place sensors and measurement equipment. Dr. Cristina Cristalli discusses challenges and opportunities for the adoption of autonomous platforms in test applications of white goods. Learn how the industry combines mobile robotics technology, robotic manipulators, and simulation tools with diagnostic capabilities, sensors, and data acquisition systems to develop innovative test solutions for the manufacturing industry.

Cristina Cristalli, Director of the Research for Innovation Group, Loccioni Group

Tuesday, August 2 ▶ 10:30–11:30 a.m. ▶ Room 17A

Undergraduate Robotics Course Mission: Operation Plug-the-Oil-Well

To engage a broader student population in robotics programming and design, we desired seamless software and hardware integration for the course. Using LabVIEW and CompactRIO, students are exposed to a graphical and textual programming approach while developing powerful control software for the embedded hardware to handle challenging tasks including autonomy, vision guidance, path planning, and feedback control.

Dr. Harry Asada, Professor, MIT

Wednesday, August 3 ▶ 10:30–11:30 a.m. ▶ Room 17A

TECHNICAL SESSIONS

Fuzzy Logic for Most of Us

Learn the basics of using fuzzy logic in a control application. This program is targeted at the developer who needs to implement a control application and is not a seasoned controls engineer. Gain an introduction to the basic terminology, how to use the Fuzzy System Designer, and how to implement a simple control system. Also view a live demo of an elementary control application.

Norm Dingle, Engineer, EMP Technical Group

Tuesday, August 2 ▶ 1:00–2:00 p.m. ▶ Room 17A

The Nitty Gritty Technical Details of the LabVIEW Robotics Module

Examine a broad range of features from the LabVIEW Robotics Module and the details of their implementation using a rugged autonomous robot platform as a case study. Learn about robot data communications, hardware abstracted I/O, FPGA sensor drivers, and teleoperation.

Dr. Karl Muecke, Staff Software Engineer, NI

Tuesday, August 2 ▶ 2:15–3:15 p.m. ▶ Room 17A

Controlling a Hyper-Dynamic Quadruped Robotic Platform With LabVIEW and NI Single-Board RIO

As mobile robots require complex structures, design engineers seek inspiration from biological models. One current project includes implementing the design process in hyper-dynamic robotics, which entails the morphological design and control architecture for highly dynamic performance of legged animals. Learn about sensor development, innovative structural design, and actuator control using LabVIEW and NI Single-Board RIO for the quadruped robot.

Dr. Sangbae Kim, Assistant Professor, MIT

Tuesday, August 2 ▸ 3:30–4:00 p.m. ▸ Room 17A

One Smart Tuna

Boston Engineering created a deployable aquatic robot, GhostSwimmer, for the Office of Naval Research using LabVIEW, LabVIEW Real-Time, and LabVIEW FPGA on an NI Single-Board RIO device and a single-board computer to emulate the fore, mid, and hindbrain activities in a fish. The three-brain control systems align perfectly with the parallel loop processing of LabVIEW on a single piece of hardware and on all three "processors" – the LabVIEW Pentium, the LabVIEW Real-Time PowerPC, and the LabVIEW FPGA.

Erik Goethert, Account Manager, Boston Engineering

Tuesday, August 2 ▸ 4:00–4:30 p.m. ▸ Room 17A

Open Control Architecture for an Industrial SCARA Robot

Examine an open architecture robot controller based on a CompactRIO system used to retrofit an industrial SCARA robot. By taking advantage of the reconfigurable I/O (RIO) platform and LabVIEW control tools, we developed a three-layer control system and performed motion control on the FPGA, path planning on the real-time processor, and a user interface on a PC. Discover how this full robot has become a powerful tool for teaching, testing, and research.

Francisco Mota, Student, Instituto Tecnológico de Celaya

Tuesday, August 2 ▸ 4:45–5:15 p.m. ▸ Room 17A

Ultralean Robotic Solutions

Industrial robots have been working hard for a long time, but now we must ask them to "think." With the capabilities of LabVIEW and data structures, we created a highly configurable platform for robotic work cells that eliminates engineering time and hardware content. This lean solution streamlines robotic work cell development and offers extended features such as hand-guided motion and artificial intelligence for self-learned robot positions and paths. View demonstrations with a live robot, and gain in-depth analysis on using LabVIEW for deployable, configurable software and hardware products.

Mark Battisti, Engineer, Comprehensive Engineering Solutions Inc.

Tuesday, August 2 ▸ 5:15–5:45 p.m. ▸ Room 17A

FIRST Robotics Using LabVIEW and CompactRIO

Learn how LabVIEW and CompactRIO are being used in the For Inspiration and Recognition of Science and Technology (*FIRST*) Robotics Competition (FRC), an international robotics program involving more than 2,000 teams and 45,000 high school students. Discover how FRC teams have tackled the unique technical challenges of the past three seasons, including autonomous navigation and computer vision.

Doug Norman, Senior Software Engineer, NI

Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 17A

Medical Simulations With Mechatronic Eyes

Learn about a pair of robotic eyes developed to help train medical students before they practice on real patients. The setup will be installed in a robotic face that's in development at Virginia Tech and will feature human functionality in terms of range of motion and degrees of freedom. NI vision tools and LabVIEW Robotics control servos to actuate blinking, motion, and dilation mechanisms.

Eric Baldrighi, **Michael Okyen**, **Michael Stevens**, and **Nicholas Thayer**, Students, Virginia Tech

Wednesday, August 3 ▸ 2:15–2:45 p.m. ▸ Room 17A

Early Experience Using LabVIEW Robotics With Industrial and Custom Serial-Linked Robots

Student-created C++ code for robotics research is often functional but difficult for others to learn and maintain. To let new students contribute more quickly and to ease the burden of code maintenance, we use LabVIEW Robotics. Examine how LabVIEW and the LabVIEW Robotics Module facilitate rapid development and deployment of robotics code in the academic research setting.

Dr. Scott Banks, Associate Professor,
Tim Elmore, Graduate Student, and
Ira Hill, Graduate Student, University of Florida

Wednesday, August 3 ▸ 2:45–3:15 p.m. ▸ Room 17A

Model-Based Design With the NI Robotics Simulator and the iRobot Create

Working with the commercially available iRobot Create, students develop embedded software in LabVIEW, test and verify using a 3D physics-based simulator, and seamlessly deploy their solution to an embedded controller. Watch as we demonstrate the complete end-to-end design process used in the lab, the 3D simulation of the iRobot Create, and the actual robot in action.

Jeff C. Jensen, LabVIEW Platform Evangelist, NI

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 17A

Hack the Kinect and Other Cool Sensors

Arthur C. Clarke said every revolutionary idea evokes three stages of reaction, which may be summed up by three phrases: it's completely impossible; it's possible, but it's not worth doing; and I said it was a good idea all along. Learn to hack the Microsoft Xbox Kinect, iRobot Create, Neato lidar, Google Android, Apple iPhone, Texas Instruments ez430-Chronos, Nintendo Wii remote and Nunchuck, and the Arduino Uno with LabVIEW.

Jeff C. Jensen, LabVIEW Platform Evangelist, and
Zach Nelson, Academic Field Engineer Group Manager, NI

Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 17A

The Aerospace and Defense Summit unites industry and research experts from the fields of advanced research, flight research, defense and commercial aerospace test, ground vehicles, radar, and unmanned vehicles. Hear directly from industry experts and system developers about the latest technologies, and learn about the tools engineers are using to design, develop, and implement systems in an evolving market.

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KEYNOTE

The State of Legacy Automated Test Systems in DoD Depots

Department of Defense (DoD) maintenance depots face a growing challenge with legacy automated test systems (ATS). These systems are critical to ensuring mission success. As they age, they are increasingly difficult to maintain and repair as well as costly to modernize or replace. When testers do not work properly, maintenance slows or stops and mission readiness is adversely affected. Having 28 of years experience in both the public and private sides of the aerospace/defense ATS industry, Dr. Carey will present the key issues that drive depot ATS equipment requirements and a technical strategy for the modernization of DoD ATS.

David Carey, Division Chief, Tobyhanna Army Depot

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 17B

TECHNICAL SESSIONS

A Scalable Common Architecture Tester for Cost-Effective, High-Product-Mix Testing

Compared to consumer electronics manufacturers, aerospace/defense manufacturers face some unique challenges when developing cost-effective test system programs. Typically, product lifetimes are longer and product mix is higher for a significantly lower volume of product. Elbit Systems of America (ESA) grew its core competency in ATS by creating a scalable common architecture test system, thereby expanding its test support capability to profitably meet these challenges.

Craig Bickley, Engineer, ESA

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 17B

Design Considerations for Building a Rugged Field Test Instrument

Field testing and troubleshooting military equipment is critical for aerospace/defense applications. Equipment that could normally be used inside a laboratory often does not meet the environmental and size requirements for deployed field testers. Environmental requirements include more stringent testing for the temperature, humidity, shock, vibration, and explosion/combustion extremes required in military specifications such as MIL-PRF-28800 and MIL-STD-810. G Systems offers real-world insight and lessons learned while using the CompactRIO platform to build rugged field test systems for military applications.

Dave Baker, Engineer, G Systems LP

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 17B

Using a Tiered Common Test Platform Architecture for Cost-Effective, High-Product-Mix Automated Test

Raytheon has developed a common test platform to help address challenges in manufacturing efficiency, cost of test, and equipment reuse. Hear about strategies for driving a common test platform that allows for broad adoption across product lines while maintaining flexibility to address unique test needs. Also discuss models for quantifying the utilization, cost, and other advantages that help show the benefits of a common test platform.

William Stout, Engineer, Raytheon Company

Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 17B

Creating a High-Speed, Low-Power, Portable Data Acquisition System

Bloomy Controls used NI Single-Board RIO contained in a backpack to develop a portable data acquisition system that monitors power consumption of devices carried on and by a person. Devices contained in the backpack are directly wired to custom CompactRIO modules. Devices that cannot be tethered use custom wireless Bluetooth slave sensors to communicate over a piconet with the NI Single-Board RIO Bluetooth master. Data and status are transmitted to a PC-based application for data storage, analysis, and display using a Wi-Fi bridge.

George Stein, Engineer, Bloomy Controls Inc.

Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 17B

RF Synthetic Instrumentation Seminar

Review synthetic instrumentation (SI) fundamentals from the perspective of implementation for military and aerospace applications. Discuss the emerging SI architectures with respect to performance, size, and cost associated with the implementation of various SI-based measurement modes. Learn about SI technology, inserting synthetic instruments into automatic test systems, and SI architectures for measurement and stimulus subsystems. Understand the hardware and software components as well as the measurement science of synthetic instruments.

Wade Lowdermilk, Scientific and Engineering Fellow, BAE Systems

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 17B

Creating a Wideband Multichannel RF Recorder for Testing Antenna Array Algorithms Using PXI Express

Because most commercially available RF recording solutions have only one to two channels and do not offer synchronization for array operations, they are not sufficient for testing RF antenna array signal processing algorithms. Additionally, most systems lack the wideband capability required to cover this RF testing scenario. ECHSE is a system that solved this challenge and is now used with null steering antenna arrays for GPS jammer and suppression as well as passive radar research.

Ulrich Wessel, Engineer, Schönhofer Sales and Engineering GmbH

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 17B

NASA Launch Vehicle Hydro-Dynamic Suspension System

Examine a case study in large-scale SCADA system architecture using CompactRIO, the LabVIEW Datalogging and Supervisory Control Module, IEEE 1588 time synchronization, and extensive HMI visualization. The hydro-dynamic suspension (HDS) system provides ground-based capability to measure dynamic modal vehicle characteristics during simulated flight phases. With 8 million pounds of lifting capacity and six degrees of freedom (6DoF) on hydraulic bearing surfaces, the HDS system will provide free flight test conditions for NASA's new heavy lift launch vehicle.

Michael Sachs, Engineer, Intelligent Systems

Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 17B

RF AND WIRELESS TEST SUMMIT

Learn about next-generation RF and wireless test technology and listen to top industry experts as they explain wireless trends, emerging instrumentation technologies, and innovative test techniques at the NIWeek RF and Wireless Test Summit. Also, gain a better understanding of a range of technologies including synthesizer design techniques, radiated wireless device testing, time-domain network analysis, and more.

TECHNICAL SESSIONS

Linking RF Design and Test: Introduction to Hardware-in-the-Loop Testing

When simulating an RF subsystem, it is often useful to introduce measured data to the simulation, a tool known as using hardware in the loop. In these applications, simulation environments such as the AWR Visual System Simulator can be used in conjunction with RF vector signal generators and analyzers to validate performance of the simulated model. Gain an in-depth understanding of AWR simulation tools and learn how you can use them in conjunction with PXI RF signal generators and analyzers.

Josh Moore, Solutions Architect, AWR

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 19A

Microwave Frequency Synthesizers: Trends and Solutions

Frequency synthesizers are key building blocks in any RF/microwave system. In addition, common design considerations often include achieving the lowest tuning time possible without sacrificing tuning speed. Compare various synthesizer techniques in terms of performance, circuit complexity, and cost impact. Also gain a high-level introduction to a technical solution for a low-cost, high-performance synthesizer.

Alexander Chenakin, Director of the Frequency Synthesis Group, Phase Matrix Inc.

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 19A

Introduction to Testing 3GPP LTE

Gain an overview of the 3GPP LTE physical layer and learn about common RF measurements for LTE including transmit power, adjacent channel power, and error vector magnitude (EVM). Also discover best practices for automating LTE measurements in design validation or production test applications.

Gerardo Orozco Valdez, Staff Systems Engineer, NI

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 19A

Over-the-Air Test Methods and Metrics

One predominant trend in the wireless industry is the migration from conducted measurements to over-the-air (OTA) testing. Modern smartphones with cellular, 3G/4G, Wi-Fi, Bluetooth, and GPS radios demand OTA test methods due to a sheer number of connections. Especially in devices using multiple antennas in products incorporating MIMO and beamforming technologies, OTA test has now become increasingly important. Review OTA test methods and metrics under development at 3GPP and CTIA and discuss practical approaches to fast and accurate OTA-based production testing.

Fanny Mlinarsky, CTO and Founder, octoScope Inc.

Wednesday, August 3 ▸ 10:30–11:00 a.m. ▸ Room 19A

Advanced RF Signal Analyzer Measurement Techniques

Getting every last decibel of dynamic range for a particular measurement requires careful attention to several signal analyzer settings including reference level, LO power, and IF bandwidth. Examine the trade-offs between each of these settings illustrating their impact on measurement accuracy and repeatability. Also learn basic techniques you can use to determine whether you're measuring the performance of your DUT or the instrument.

Raajit Lall, Product Manager, NI

Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 19A

The Art of Benchmarking Measurement Speed: PXI Versus Benchtop Instruments

For engineers automating measurements, speed is everything. However, quantifying the measurement speed is often difficult, requiring careful attention to settings such as averaging, number of symbols, capture period, and other factors. Learn the fundamental trade-offs of each of these factors, best practices to optimize overall test time, and walk through a thorough benchmark comparison with a common rack-and-stack instrument to see how it compares with PXI.

David Hall, Product Manager, NI

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 19A

Advanced Network Analyzer Measurement Techniques

Vector network analyzers (VNAs) are some of the most complex RF instruments, but engineers can use them to perform a wide range of measurements. Learn some VNA calibration techniques and explore advanced measurement concepts, including time-domain measurements.

David Broadbent, Product Manager, NI

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 19A

LightSquared and GNSS: A Case Study on Introducing New Interference Impairments

LightSquared's high-powered signals are threatening high-precision GNSS receivers, especially the nearby commercial StarFire augmentation service. As a result, characterization on GNSS receivers in the physical environment has become an increasingly important element of GNSS receiver testing. Learn how Averna's wideband record and playback system enables GNSS record and playback and captures and introduces LightSquared impairments into GNSS receiver testing.

Presented by Averna

Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 19A

VISION SUMMIT

Expand your technical expertise by attending one of the most comprehensive conference lineups in North America at the NIWeek Vision Summit. Participate in hands-on workshops and technical sessions presented by NI developers, industry experts, and academic professionals. Learn how to get started with imaging and gain insight into the latest products and technologies, best practices, and real-world case studies.

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KEYNOTES

How NI Technology Powers the Space Elevator

LaserMotive's first project earned $900,000 USD in the NASA-sponsored Power Beaming Challenge in the Space Elevator Games. The system transfers power wirelessly via laser light to a remote, airborne, mobile photovoltaic receiver that can be located 1 km away or more. Learn about a machine vision system based on NI tools and how it can automatically locate the receiver and steer the laser beam.

Cartsen Erickson, Engineer, LaserMotive

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 19B

Industry Trends and Intelligent Production Systems of the Future

Gain insight into technology trends in the vision industry, and explore techniques that are being borrowed and adapted across industries and applications. Discover how inspection systems are used to add intelligence into manufacturing processes to get closer to zero-defect manufacturing with examples using LabVIEW and NI vision products.

Björn Damm, Executive Director of the Interdisciplinary Imaging and Vision Institute, RWTH Aachen University

Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 19B

TECHNICAL SESSIONS

h Getting Started With NI Vision

Explore the features of NI Vision Builder AI in an instructor-led environment. Learn how to acquire and process images and build complete applications using NI vision hardware, including NI Smart Cameras.

Elmar Widowitz, Staff Product Support Engineer, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 18D
Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 18D
Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 18D

Precision Metrology

Learn about the latest in precision metrology techniques to meet the increasingly demanding expectations for inspecting complex parts in the electronics, semiconductor (solar), and manufacturing industries. Explore the advances in NI vision tools to address the two critical components of the challenge: spatial calibration and measurement tools.

Antony Vance, Senior Engineer, NI

Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 19B

VISION SUMMIT

Wacky Optical Tricks for Machine Vision

View a live demonstration of wacky optics including the use of spherical mirrors to create virtual images that can be inspected, circular polarizers, and cone-shaped reflectors to image inside small spaces.

Robert Tait, Researcher, GE Global Research

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 19B

Panel Discussion: Latest in Camera Technologies

Listen as industry experts from five camera companies, including Basler Vision Technologies and Pleora Technologies, share their views on the latest camera technologies including emerging camera buses, synchronization, bus-powered imaging protocols, and image sensors.

Presented by Industry Experts

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 19B

Machine Vision and Industrial Robotics: From Design Concepts to Factory Floor Deployment

Explore best practices to build vision-guided robotics production machines based on LabVIEW. Learn about LabVIEW interfaces for industrial robots from KUKA, Mitsubishi, DENSO, and more, and calibration considerations for such systems. Examine several real applications in the field of flexible manufacturing, ranging from cosmetics and pharmaceutical packaging to fully automated assembly of electrical components.

Mauro Capetti, Software Development Engineer, and **Ignazio Piacentini**, CEO, ImagingLab

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 19B

Is LabVIEW FPGA Right for My Vision Application?

LabVIEW FPGA offers significant performance benefits for some vision applications and enables others that would not be possible with traditional CPU-based processing. Typical FPGA success stories involve applications in which a combination of high frame rate, tight I/O timing requirements, and direct communication with other devices suggest an embedded hardware-based approach. Learn how to evaluate prospective vision applications and choose the most appropriate system architecture.

Brent Runnels, Senior Systems Engineer, NI

Wednesday, August 3 ▸ 2:15–2:45 p.m. ▸ Room 19B

Autofocus System for an Ellipsometer

Learn how Nanometrics Inc., a leading supplier in the semiconductor industry, uses NI tools to prototype, design, and deploy advanced metrology systems. Learn about an autofocus solution for its ellipsometer, which led to a flexible and scalable final design involving FPGA imaging technology, and that is capable of rates up to 4,000 frames per second.

Amit Shachaf, Senior Research Scientist, Nanometrics Inc.

Wednesday, August 3 ▸ 2:45–3:15 p.m. ▸ Room 19B

Developing a Quality Inspection Method for Selective Laser Melting of Metals Using a High-Speed NIR Camera

In the selective laser melting (SLM) process, a high-speed laser beam melts thin layers of metal powder to build parts with complex structures. Gaps in quality control, from overheating and coater defects, must be addressed for SLM to become a real option in industries such as aerospace and medicine, where high quality is critical for performance. Learn about the award-winning solution based on NI vision and FPGA products.

Tom Craeghs, Production Engineer, Katholieke Universiteit Leuven

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 19B

Web Inspection of Optical and Medical Fibers

With optical fibers, typically used for communication systems, defects can inhibit the optical quality and structural integrity. For medical fibers, used for internal sutures, contamination and structural integrity are of utmost concern. Unfortunately, the manufacturing process can result in defects such as fiber diameter variation, surface abrasion, internal consistency defects, contamination, and gouges. Explore the capabilities of Adsys Control's NI Platform Web Inspection System on optical and medical fibers and its ability to detect micron-scale defects at manufacturing line rates.

Brent Bergan, Embedded Product Manager, and **Brian Goldberg**, President, Adsys Controls Inc.

Wednesday, August 3 ▸ 4:00–4:30 p.m. ▸ Room 19B

VISION SUMMIT

Development of a Digitally Multiplexed Bioassay Reader With Magnetic Bead Technology

Learn about the development of an automated microscopy system used to image bar-coded nanobeads. These beads have specific biomarkers on them matched to their respective bar codes. Thousands of beads are poured into a 96-well titer plate for analysis. The system performs bead detection, bar-code reading, and fluorescent imaging to determine whether the reagent has been activated. moviMED used LabVIEW and the NI Vision Development Module to build a fully functional prototype in about three months.

Markus Tarin, President and CEO, moviMED

Wednesday, August 3 ▸ 4:45–5:15 p.m. ▸ Room 19B

Breaking New Ground With Vision Inspection Systems

Discover secrets for creating a vision system for which no other solution exists. Explore how Coleman Technologies quickly created a conveyor system for inspecting complex dinnerware, and learn the keys that any pioneering vision application can use to alleviate risk and overcome unforeseen challenges. Also, learn new imaging techniques and analysis algorithms using NI vision, including 3D laser mapping and customized local thresholding.

Dan Milkie, Senior Developer, Coleman Technologies Inc.

Wednesday, August 3 ▸ 5:15–5:45 p.m. ▸ Room 19B

3D Vision and the Kinect

Watch as we tear down the functionality of the Kinect to divulge how stereovision works. Learn how this 3D technique has become prevalent for industrial inspection, autonomous robotics, and consumer electronics. Examine the considerations in working with 3D vision, including calibration, and learn tips and tricks for how you can use such a sensor setup with NI software.

Dinesh Nair, Principal Software Architect, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 19B

INDUSTRY CERTIFICATION EXAM FOR INTEGRATORS

Validate your development skills and become a certified vision professional during NIWeek by taking the Certified Vision Professional (CVP) Basic exam, offered by the Automated Imaging Association (AIA). The fee for this exam is $250 USD.

Monday, August 1 ▸ 4:30–5:30 p.m. ▸ Room 19B

TECHNICAL SESSIONS

The advanced technical sessions discuss some of the most sophisticated applications of evolving technology in industry and academia. Targeted at those with proficiency in their respective topics, these sessions feature knowledge-sharing from leading experts in their fields. Advanced technical sessions include the following:

▶ ADVANCED TECHNICAL SESSIONS

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The machine condition monitoring (MCM) sessions focus on the tools and techniques used for developing MCM solutions. Learn from industry experts and NI R&D about best practices and the latest tools to help make your MCM systems successful at the following sessions:

▶ MACHINE CONDITION MONITORING SESSIONS

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TECHNICAL SESSIONS

NIWeek hands-on technical sessions give attendees the chance to interact directly with the latest technologies and the experts who developed them. In these popular forums, you have the opportunity to learn how to use these tools and how to work with them more efficiently. Attend the following technical sessions to get hands-on experience:

▶ HANDS-ON TECHNICAL SESSIONS

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Attend the following motion control-related sessions to learn how to take your motion application to the next level with the LabVIEW NI SoftMotion Module and CompactRIO:

▶ MOTION CONTROL SESSIONS

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Learn new techniques that will give you a leg up as you develop and deploy new LabVIEW applications by attending the following five technical LabVIEW sessions:

▶ CAN'T MISS LabVIEW SESSIONS

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TECHNICAL SESSIONS

Addressing Bandwidth Challenges of Embedded Industrial Applications

FPGAs are quickly becoming one of the primary solutions for addressing the technical bandwidth challenges historically solved with DSPs and microprocessors. Learn about the benefits of using FPGA-based solutions for embedded industrial applications. Examples include safety, control algorithms, and industrial networking.

Keith Nesrsta, ISM Business Development Manager – Americas, Xilinx

Thursday, August 4 ▶ 10:30–11:30 a.m. ▶ Room 16A

a Advanced Motion and Vision Integration

Integrated motion-vision systems can automate tasks at accuracies and speeds that provide next-generation machines with faster throughput, higher quality, and lower cost. These benefits are being used across many applications including life sciences, robotics, and general automation. Gain in-depth analysis of the different integration levels starting from the basic to highly advanced applications requiring FPGA-based solutions.

Bill Allai, Principal Hardware Engineer, and
Priya Ramachandran, Senior Hardware Engineer, NI

Wednesday, August 3 ▶ 1:00–2:00 p.m. ▶ Room 12A

a Advanced Motion Control for Machine Automation

Servo systems provide fast command response, outstanding disturbance rejection, and highly repeatable motion. Discuss advanced servo algorithms such as observers, high-order filters, and multiple feed-forward paths. Also learn how to configure and tune your system including the roles of automatic and manual tuning methods.

George Ellis, Chief Engineer, Kollmorgen

Tuesday, August 2 ▶ 3:30–4:30 p.m. ▶ Room 11A

Best Practices for Development With the LabVIEW FPGA Module

Some ways to approach FPGA design with LabVIEW are better than others. Listen to a senior digital design engineer and long-time LabVIEW FPGA enthusiast as he shares best practices to deliver successful FPGA designs.

John Ammerman, Senior Hardware Engineer, NI

Tuesday, August 2 ▶ 2:15–3:15 p.m. ▶ Room 11A

Best Practices for Qualifying Electric Vehicle Battery Systems

After many years of R&D, Bathium Canada Inc. has produced an efficient battery designed for fully electric vehicles that is now ready to enter production. Learn tips and tricks for minimizing the cost per test station by sharing expensive resources such as the power cycling unit, and how to use LabVIEW and NI TestStand to optimize production test performance.

Yves Lemay, Software Architect, Averna

Thursday, August 4 ▶ 2:15–3:15 p.m. ▶ Room 19A

Best Practices for Securing NI RIO Systems

In the wake of the recent Stuxnet worm, there is a renewed focus on industrial and embedded device security. Explore best practices for securing both development machines and NI reconfigurable I/O (RIO) hardware targets to protect IP, keep sensitive data private, and prevent intrusions.

Sanjay Challa, Engineer, NI

Wednesday, August 3 ▶ 4:45–5:45 p.m. ▶ Room 12A

Building a Complete Data Monitoring and Storage System With CompactRIO

Building a configurable monitoring system for synchronized measurements can be challenging. Design considerations include robustness, compatibility, configurability, acquisition speed, and traceability. Examine the software design considerations for engineering such a system, and discuss advanced software techniques, design patterns, and software architectures.

Arnoud de Kuijper, Engineer, T&M Solutions B.V.

Tuesday, August 2 ▶ 4:45–5:45 p.m. ▶ Room 11A

TECHNICAL SESSIONS

a Advanced Topic
h Hands-On Topic

a Building Support for Third-Party Motion Drives

Learn how to build hardware extensions for third-party and custom motor drives in the LabVIEW NI SoftMotion Module using any industrial communication protocol. Understand how to use high-level LabVIEW NI SoftMotion objects to make custom motion applications manageable. Also, review a detailed case study of the Maxon CANopen NI SoftMotion driver, available in the LabVIEW Tools Network.

Marc Christenson, Systems Engineer, SISU Devices

Thursday, August 4 ▶ 10:30–11:30 a.m. ▶ Room 19A

h CompactRIO Part I: Programming With LabVIEW Real-Time

Learn how to quickly build and deploy embedded monitoring and control applications using graphical programming with CompactRIO and LabVIEW Real-Time. Also explore LabVIEW Real-Time features that increase flexibility and integration with the FPGA when programming CompactRIO in NI Scan Mode.

Asa Kirby, Product Manager, NI

Tuesday, August 2 ▶ 3:30–4:30 p.m. ▶ Room 18B
Wednesday, August 3 ▶ 2:15–3:15 p.m. ▶ Room 18B

h CompactRIO Part II: Programming With LabVIEW FPGA

Learn the basics of customizing CompactRIO with LabVIEW FPGA programming. Attendees should have basic knowledge of LabVIEW and LabVIEW Real-Time.

Asa Kirby, Product Manager, NI

Wednesday, August 3 ▶ 10:30–11:30 a.m. ▶ Room 18B
Wednesday, August 3 ▶ 4:45–5:45 p.m. ▶ Room 18B

a Debugging and Verification of LabVIEW FPGA Designs With Cycle Accurate Simulation

Learn how you can debug or verify your LabVIEW FPGA Module designs using cycle accurate simulation with ModelSim and Xilinx ISim. Attendees should have hardware description language (HDL) knowledge.

Kristin Hampsten, Senior Hardware Engineer, NI

Tuesday, August 2 ▶ 1:00–2:00 p.m. ▶ Room 19A

a Designing High-Throughput Algorithms in LabVIEW FPGA for NI FlexRIO

Learn techniques, tips, and tricks for how to break the 40 MHz barrier with LabVIEW FPGA and compile at up to 250 MHz and beyond. Access the full potential of your NI FlexRIO FPGA adapter modules with deterministic, low-latency, high-throughput FPGA-based processing.

Browning Griggs, Project Engineer, NI

Tuesday, August 2 ▶ 2:15–3:15 p.m. ▶ Room 16A

Design Patterns for LabVIEW FPGA

Design patterns are conceptual solutions to common problems and can be applied in a variety of situations. Examine several design patterns applicable to systems designed with LabVIEW FPGA and how we solved a problem by composing an FPGA application out of several of those design patterns.

Gerardo Garcia, Product Manager, NI

Wednesday, August 3 ▶ 1:00–2:00 p.m. ▶ Room 16A

Developing a Powerful HMI Application Using NI Hardware and Windows Embedded Software

Learn how to develop a polished Windows Embedded HMI application that has high reliability, efficient management of large interfaces, and improved user responsiveness and resource utilization. Using these techniques, and other OS tips and tricks, you can improve the look, feel, and operation of your deployed HMI.

Andrew Mierau, R&D Product Engineer, NI

Wednesday, August 3 ▶ 3:30–4:30 p.m. ▶ Room 12A

TECHNICAL SESSIONS

Developing a Wind Turbine Condition Monitoring System

CompactRIO is an ideal platform for embedded, high-speed data logging and can be used to effectively monitor the conditions of industrial machines and equipment. As these machines become more complex, datalogger requirements have evolved to include mixed measurement speeds and types as well as remote data streaming. Watch and listen as industry experts present an architecture that you can replicate to build and deploy such a system using a wind turbine as the backdrop for their approach.

Bong-Ki Kim and **SangRyul Kim**, Senior Researchers, Korea Institute of Machinery and Materials
Youngkey Kim, CEO, SM Instruments
Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 12A

Developing LabVIEW FPGA Host VIs for Reuse and Distribution

With the dynamic mode of the LabVIEW FPGA host interface, introduced in LabVIEW 2010, you can construct host subVIs that can be reused with a variety of FPGA VIs and different targets. Learn when and how you can take advantage of this functionality to create host subVIs that can be reused within one application or distributed to others.

Matt Novacek, Senior Software Engineer, NI
Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 12A

a Digital Signal Processing in LabVIEW FPGA With NI FlexRIO

DSP on FPGAs requires additional considerations over host-based implementations, including fixed-point data representations, real-time performance, and efficient resource use. Learn how to achieve powerful FPGA-based DSP with a design methodology that uses various tools to maximize success and minimize design time.

Ryan Verret, Product Manager, NI
Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 16A

Distributed Intelligence: Using the LabVIEW WSN Module to Perform Local Analysis and Control

Get an under the hood look at the programmable capabilities of NI wireless sensor network (WSN) measurement nodes. Learn about the low-power WSN state machine and how LabVIEW programming can accomplish local analysis, data reduction, and control in your wireless remote monitoring systems.

Corby Bryan, Wireless Product Support Engineer, and
Nicholas Butler, Product Manager, NI
Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 16A

Extending the Lifetime of Solar Tracking Systems

To design solar tracking systems for a 25-year life requires the ability to predict life-time reliability. Learn how SolFocus, a leader in high-concentration photovoltaic (HCPV) power systems, uses NI tools to perform highly accelerated life-cycle testing of full tracking systems, from power electronics to motors and mechanical assemblies.

Jon Elerath, Staff Reliability Engineer, SolFocus Inc.
Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 11A

How to Embed NI RIO and Data Acquisition Hardware Into Your System

Learn how to select and integrate the appropriate NI hardware for embedded and OEM applications. Explore elements such as programming, OSs, enclosures, mounting, wiring, signal connectivity, displays, and certification.

Sam Freed, Product Manager, NI
Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 16B

Increase Reliability and Performance With Intel Processors and the Microsoft Windows Embedded OS

Take advantage of the software and hardware features included in the Microsoft Windows Embedded OS and Intel processors that let you create rich, powerful, and reliable embedded applications using NI embedded devices.

Presented by Intel and NI
Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 16A

TECHNICAL SESSIONS

a Advanced Topic
h Hands-On Topic

Laboratory Automation for Genome Sequencing

Boston Engineering has completed two projects using LabVIEW to automate genome sequencing, identification, and mutation. Discuss these cutting-edge technologies and how we used LabVIEW to fully control and monitor each system using more than 12 parallel loops in each. Learn tips to manage a complex control system that uses NI and third-party hardware, how to test the system with and without hardware, and lessons learned between the first and second projects.

Jason Burns, Senior Controls Engineer, Boston Engineering
Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 19A

LabVIEW Embedded Tips and Tricks

As one of the earliest adopters of the LabVIEW Embedded Module for ARM Microcontrollers and LabVIEW Embedded Module for ADI Blackfin Processors, Boston Engineering developed a unique portfolio of tips and tricks through a combination of projects and close relationships with NI. Gain insight into proper LabVIEW embedded programming and debugging techniques.

Jason Burns, Senior Controls Engineer, Boston Engineering
Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 16A

h Making High-Speed Waveform Acquisition Easier on CompactRIO

Learn how to use the CompactRIO Waveform Acquisition Library for high-speed data acquisition on CompactRIO and how you can easily integrate this architecture into future applications for faster deployment.

Jeff Tipps, Systems Engineer, NI
Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 18B
Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 18B

New IP Available for Xilinx FPGAs Through Open Standards

As FPGA-based designs become more complex, and in some cases the heart of system designs, the need for easy-to-use IP is imperative. See how Xilinx has standardized its tools and IP on open industry standards to enable an easy-to-use delivery mechanism for Xilinx, third-party ecosystem, and a customer's internally developed IP.

Tim Vanevenhoven, Senior Manager of IP Design Methodology, Xilinx
Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 12B

NI C Series and Beyond: How to Add Custom I/O to Your Embedded RIO System

Find out how to create and build custom C Series modules. Also, see the latest methods to customize NI Single-Board RIO and CompactRIO systems with daughter cards and expansion modules.

Matt Spexarth, Product Manager,
Salvador Santolucito, Staff Hardware Engineer, and
John Harvey, Product Support Engineer, NI
Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 16A

NI SoftMotion: Taking Motion Control to the Next Level

Explore advanced motion control for CompactRIO systems. Learn about embedded system architectures for motion, C Series drive modules, integration with third-party products, and motion over EtherCAT and CANopen interfaces.

Kiran Sreekantham, Senior Software Engineer, NI
Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 11A

TECHNICAL SESSIONS

Photovoltaic Field Test: The Challenges and Methodologies

Solar energy may be the next best energy source and there have been numerous development efforts for new photovoltaic materials to achieve grid parity. However, there are limitations to current test methods, such as cable loss, inverter effect, and grid instability, in verifying these new photovoltaic modules and their long-term energy yield and efficiency. Learn how to resolve these limitations and what to consider when testing various photovoltaic materials.

Jin ByungJin, CEO, ONTEST

Thursday, August 4 ▶ 10:30–11:30 a.m. ▶ Room 16B

Power Measurements 101

Learn power basics as well as how to make some of the most common power measurements with NI tools including LabVIEW, NI CompactDAQ, and CompactRIO. Applications for power are widespread, but some of the more popular needs right now include appliance testing, renewable energy device monitoring, and smart grid research.

Brett Burger, Product Manager, NI

Tuesday, August 2 ▶ 1:00–2:00 p.m. ▶ Room 16A

Pushing the Limits of CompactRIO

Signal.X Technologies has developed an automated test system that uses CompactRIO to execute functions that previously required several different controllers or PLCs. Explore the technical development aspects when mission-critical reliability, continuous operation, highly parallel architecture, and high processor load situations are present.

Robert Hoffman, Engineer, Signal.X Technologies

Tuesday, August 2 ▶ 1:00–2:00 p.m. ▶ Room 11A

Rapid Development of Space Applications With the Honeywell Responsive Digital Electronics Board and LabVIEW FPGA

Take a look at the Honeywell responsive digital electronics (RDE) platform, designed for use in space using LabVIEW FPGA to design and build new digital data processing, control, and interfacing applications for flight in space. Learn how Honeywell used the RDE board and LabVIEW FPGA to rapidly develop and implement a prototype thrust control system. The RDE is based on the Xilinx Virtex-5QV radiation-hardened FPGA, and provides a migration path from commercial electronics to space-rated hardware without rewriting IP.

Brett McMickell and **Thom Kreider**, Engineers, Honeywell

Thursday, August 4 ▶ 2:15–3:15 p.m. ▶ Room 16B

Selecting the Right Visualization Approach for Your Next Application

Many distributed and embedded applications require a way for an operator to visualize and interact with the system. Learn about the common visualization hardware and software architectures available and which NI tool is appropriate to shorten your time to market.

Jonah Paul, Product Manager, NI

Wednesday, August 3 ▶ 10:30–11:30 a.m. ▶ Room 16A

Simplifying High-Speed Waveform Acquisition on CompactRIO

FPGA programming on CompactRIO can get complicated quickly, especially when dealing with the high-bandwidth requirements of high-speed waveform acquisition. Learn about an architecture that provides a starting point in the FPGA with built-in performance optimization as well as a LabVIEW API experience for calling the FPGA from LabVIEW Real-Time.

Douglas Farrell, Product Engineer,
Preston Johnson, Platform Manager, and
Jeff Tipps, Systems Engineer, NI

Wednesday, August 3 ▶ 4:45–5:45 p.m. ▶ Room 16A

TECHNICAL SESSIONS

Tips and Tricks for Deploying a RIO System

Discuss the tools and gain insight into how to deploy, replicate, and protect an embedded system based on CompactRIO or NI Single-Board RIO.

Asa Kirby and **Arves Stolpe**, Product Managers, NI

Thursday, August 4 ▶ 10:30–11:30 a.m. ▶ Room 12A

Tuning Deployed Real-Time Applications

Do you deploy LabVIEW Real-Time applications? Would tools designed to help manage software parameter sets and seamlessly implement fault logs be useful for your applications? Learn about a toolkit for LabVIEW Real-Time that can deliver these capabilities and more.

Gary Parente, Product Engineer, NI

Tuesday, August 2 ▶ 10:30–11:30 a.m. ▶ Room 19A

Virtual Prototyping With SolidWorks and NI SoftMotion

Simulate a 3D CAD model of your machine within minutes and learn how to design and implement multiaxes motion trajectories with the LabVIEW NI SoftMotion Module to bring your SolidWorks model to life. You can use this interface between LabVIEW NI SoftMotion and SolidWorks to visualize machine movements, check for collisions, and size motors, all with the same LabVIEW code you deploy to actual hardware.

Stephen Endersby, Product Manager – Simulation, Dassault Systèmes SolidWorks Corp. (SolidWorks)

Wednesday, August 3 ▶ 3:30–4:30 p.m. ▶ Room 11B

What's New With CompactRIO

Explore the new hardware and software features for CompactRIO and how they can increase your design capabilities and efficiency.

Arves Stolpe, Product Manager, NI

Wednesday, August 3 ▶ 1:00–2:00 p.m. ▶ Room 11B

Windows Arrives on CompactRIO

Discuss the first CompactRIO system with native Windows support. Learn about the technology powering the new multicore NI cRIO-908x including design decisions, key application considerations, and how this architecture change affects controller and host software implementations. Also learn about the high-performance Intel Core i7 dual-core processor that powers CompactRIO to solve the most challenging applications.

Asa Kirby, Product Manager, NI

Thursday, August 4 ▶ 1:00–2:00 p.m. ▶ Room 16A

Wireless Measurements Go Mainstream: Dive Into the World of NI WSNs

Explore everything from common WSN myths to deployment tips and tricks, including an in-depth look at WSN topologies and networking from NI WSN developers. Leave with an understanding of how NI WSNs can solve the challenges of your remote monitoring and control applications. Also cover features and specifications of the new WSN nodes and gateways, which include better integration with the CompactRIO platform.

Nicholas Butler, Product Manager, NI

Tuesday, August 2 ▶ 3:30–4:30 p.m. ▶ Room 16A

h Wireless Sensor Networks

Become familiar with the newest WSN measurement nodes and gateways and leave with the ability to configure a WSN, extract measurement data, and embed local analysis and control logic onto the WSN measurement nodes using the LabVIEW WSN Module Pioneer.

Nicholas Butler, Product Manager, NI

Wednesday, August 3 ▶ 1:00–2:00 p.m. ▶ Room 18D
Wednesday, August 3 ▶ 4:45–5:45 p.m. ▶ Room 18D

TECHNICAL SESSIONS

SOFTWARE DEVELOPMENT TECHNIQUES TRACK

a A Cellular-Enabled, In-Vehicle CompactRIO Logger for Fuel Economy Analysis

In the trucking industry, understanding a vehicle's duty cycle and optimizing fuel economy are critical to reducing operating costs. Learn about an in-vehicle logger based on CompactRIO developed to accurately analyze and trend vehicle operating conditions. Users can monitor the loggers from a smartphone and data is uploaded to the NI technical data cloud.

Scott Sirrine, Lead Product Engineer, Eaton Corporation

Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 14

a Advanced Error Handling in LabVIEW

Examine the challenges of implementing a full-featured error handling strategy in LabVIEW and the tools to meet some of the most common error handling needs. Discuss error classification and description; central versus specific error handling; and techniques for communicating, logging, and reporting errors.

Ryan King, Systems Engineer, NI

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 14

Benchmarking LabVIEW Performance

Benchmarking is hard. Factors such as CPU and disk caches, compiler optimizations, and OS prefetching can affect the consistency and accuracy of results. See the techniques that the LabVIEW compiler and performance teams use to accurately benchmark LabVIEW VIs and application performance.

Philip Carmichael, Principal Software Engineer, NI

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 12A

Best Practices for Developing .M File Code for Real-Time Applications

Using the LabVIEW MathScript RT Module, developers can deploy custom .m files directly to embedded hardware. As with any real-time application, the responsibility of testing for jitter and validating the deterministic behavior of the application lies with the developer. Explore techniques for developing real-time applications using the LabVIEW MathScript RT Module.

Kevin Crotty, LabVIEW Staff Software Engineer, and
Rishi Gosalia, LabVIEW Platforms Group Manager, NI

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 11A

Best Practices for LabVIEW Real-Time Development

Go into your next LabVIEW Real-Time project with confidence. Gain insight from NI experts on how to improve reliability, reduce jitter, and optimize performance in your real-time systems.

Tanya Visser, Engineer, NI

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 13A/B

a Beyond State Machines: Building Modular Applications in LabVIEW

Nearly every significant LabVIEW application uses multiple loops and several pieces of hardware. Coordinating these moving pieces can create a recipe for unreadable code. Learn how to use a template for interprocess communication based on "public" and "private" events that is easy enough for intermediate developers but powerful enough for Certified LabVIEW Architects.

Justin Goeres, System Integration Expert, JKI

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 14

Building Plug-In Architectures and HALs

Watch as we apply two popular software design patterns from the Gang-of-Four text to illustrate examples of powerful and scalable architectures in LabVIEW. View a command pattern as an alternative to a traditional producer-consumer pattern in demonstrating basic object-oriented concepts. This example also illustrates the use of a factory pattern to dynamically load and create plug-ins, which is used in a HAL example.

Elijah Kerry, LabVIEW Product Manager, NI

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 17B

Building Quality LabVIEW User Interfaces

Review the components of a good LabVIEW user interface and design techniques aimed to communicate the purpose and function of your application at a glance. This session is for developers who build applications for others or who work on code that will be handed off for future development and maintenance.

Simon Hogg, LabVIEW Product Manager, and
Nitin Thomas, Staff Software Engineer, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 13A/B

TECHNICAL SESSIONS

SOFTWARE DEVELOPMENT TECHNIQUES TRACK

a Advanced Topic
h Hands-On Topic

Changing Your Mindset for LabVIEW Real-Time and LabVIEW FPGA Programming

Have you used LabVIEW for your desktop and considered using LabVIEW Real-Time or LabVIEW FPGA for your next project? Learn what to expect when making the transition and how to avoid common pitfalls.

Ryan King, Systems Engineer, NI

Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 14

a Custom NI TestStand Reports

Don't let your need for custom data reporting and display dissuade you from using an off-the-shelf solution. Learn several ways to tailor built-in reports for NI TestStand to even the most exact standards, and watch demos ranging from quick edits to full custom report templates.

Elaine Ramundo, Customer Education Manager, Bloomy Controls Inc.

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 17B

Customizing LabVIEW Controls and Indicators

The LabVIEW control editor lets you modify how the built-in controls and indicators look. Walk through what you can do with the control editor, how to do it, and a behind-the-scenes look at how they created the new "Silver" control theme in LabVIEW 2011.

Simon Hogg, LabVIEW Product Manager, and
Christina Rogers, Senior Software Engineer, NI

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 13A/B

h Data Management and Postprocessing for LabVIEW Data

When using the wrong tools, making sense of data acquired with LabVIEW is easier said than done. Explore DIAdem and learn to gain data postprocessing productivity by using data management techniques to quickly locate and load data from any file format, graph and visualize data without the limitations imposed by software such as Microsoft Excel, perform interactive engineering analysis, export professional reports, and automate repetitive processing tasks.

Derrick Snyder, Product Manager, NI

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 18C
Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 18C

Developing ANSI C Applications to Communicate With FPGAs

Discover how you can start designing sophisticated ANSI C FPGA-based systems with NI RIO technology. See how LabWindows/CVI coupled with custom FPGA interface C APIs provides an ANSI C integrated development environment for creating advanced host applications for FPGA communication.

Kent Johnson, Senior Software Engineer, and
Anna Kozminski, Product Manager, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 11B

h Developing a Web-Based Thin Client With the LabVIEW Web UI Builder

Learn how to develop a web-based user interface that lets users remotely monitor or control measurement applications based on LabVIEW from a web browser.

Michael Neal, Senior Product Manager, and
Diya Mukherji, Software Group Manager, NI

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 18B

Developing Web-Based User Interfaces

Engineers often need to monitor remote measurement and automation systems through web browsers. Explore the LabVIEW Web UI Builder, an NI tool for developing lightweight, web-based applications that can be combined with LabVIEW RESTful web services, to create powerful, flexible solutions for monitoring LabVIEW systems over the web.

Diya Mukherji, Software Group Manager, and
Michael Neal, Senior Product Manager, NI

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 13A/B

Flexible GUI for Vibration Analysis With LabVIEW

Engineers and scientists who specialize in rotating machinery vibration troubleshooting are continuously adjusting their game plan. Maximizing the troubleshooting potential of the field engineer requires a rapidly configurable software program. Explore key programming concepts involved in creating such a program with LabVIEW, including working with tree displays and subpanels.

Jeremy Weiss, Engineer, Mechanical Solutions Inc.

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 11B

TECHNICAL SESSIONS

Introduction to OOP in LabVIEW

Gain an introduction to OOP, when and why you should use it, and how to use OOP in LabVIEW. Attendees can be LabVIEW developers who are new to OOP as well as developers familiar with OOP principles in other languages who want to learn how to apply that knowledge to their LabVIEW code.

Adam Kemp, Staff Software Engineer, NI

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 13A/B

h Introduction to OOP in LabVIEW

If you already understand the concepts behind OOP, this session will give you an opportunity to learn the mechanics behind implementing object-oriented designs, including the state pattern and factory pattern, in LabVIEW.

Elijah Kerry, LabVIEW Product Manager,
Stephen Mercer, Senior Software Engineer, NI

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 18C
Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 18C

Introducing LabVIEW 2011

Attend this staple NIWeek session to learn about the new LabVIEW features designed to make you a better and more efficient programmer, and take a demo-heavy tour through the LabVIEW platform.

Jeffrey Phillips, LabVIEW Product Manager, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 13A/B
Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 13A/B

h Introduction to LabVIEW

Never used LabVIEW before? Learn fundamental LabVIEW concepts such as dataflow, wiring, basic structures, creating user interfaces, and simple debugging.

Elijah Kerry, LabVIEW Product Manager, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 18C

Introduction to VI Scripting in LabVIEW

Gain an introduction to programmatically creating, modifying, and inspecting G code. Familiarity with VI Server is recommended but not required.

Trevor Christman, Staff Software Engineer, NI

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 14

Introduction to Virtualization and the NI Real-Time Hypervisor

Learn how you can combine real-time processing and a user interface on the same PXI or industrial controller using NI Real-Time Hypervisor software. Also, gain an overview of virtualization technology and the benefits and drawbacks of using a hypervisor.

Casey Weltzin, Product Manager, NI

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 13A/B

h LabVIEW Design Process Simplified: Introduction to State Machines

Learn how to simplify the LabVIEW design process through the most common architecture – state machines. Explore the basics of state machines and learn how to apply them to LabVIEW applications.

Adri Kruger, Product Manager, NI

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 18C
Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 18C

LabVIEW FPGA Under the Hood

Have you ever wondered how the LabVIEW FPGA Module actually runs LabVIEW code on an FPGA? View the LabVIEW block diagram synthesized down into basic digital logic blocks of an FPGA.

Donovan Buck, LabVIEW FPGA Product Support Engineer, and
Rick Kuhlman, LabVIEW FPGA Product Manager, NI

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 14

TECHNICAL SESSIONS

LabVIEW to DIAdem: Doing More With Your Data

You wrote a LabVIEW app that uses all the latest programming techniques and has an awesome user interface and beautiful documentation. But how do you take the data you collected and turn it into something you want to give to your boss?

Joe Gerhardstein, Engineer, Averna

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 11B

h Manage Reusable Code and Build Commercial Software With VI Package Manager

Do you need to package your LabVIEW code in reusable components that are easy to track and share with other users, easily install VIs on multiple computers and versions of LabVIEW, or license your LabVIEW packages to quickly turn your code into a commercial product? Learn how to set up the most efficient processes for your team to build and distribute VIs and utilities for free.

Chris Bolin, Partner Program Engineer, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 18C
Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 18C

.NET for the LabVIEW Developer

One of the many strengths of the LabVIEW development environment is its ease of integration with other technologies such as the Microsoft .NET platform. Learn about the .NET platform and how you can easily integrate with this environment. Watch demonstrations with LabVIEW and Microsoft Visual Studio .NET.

Michael Piehler, Embedded Software Engineer, The Boeing Company

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 14

NI TestStand Operator Interface Development in Practice

Learn best practices on how to architect and develop NI TestStand operator interfaces using LabVIEW software and see how toolkits can simplify operator interface development by abstracting common functionality.

Henrik Molsen and **Morten Pedersen**, Engineers, CIM Industrial Systems A/S

Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 11B

Overcoming Microsoft Excel's Limitations for LabVIEW Data Analysis and Reporting

Have you ever groaned when Excel couldn't graph all the data in your file? If you're frustrated with Excel being too slow or its inability to handle the size or format of your data file, learn how to use a tool designed for engineers instead of being limited by one designed for accountants.

Derrick Snyder, Product Manager, and
Brad Turpin, Senior R&D Product Support Engineer, NI

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 14

Introduction to the LabVIEW FPGA Module

Explore how you can use the LabVIEW FPGA Module to take advantage of reconfigurable hardware with graphical programming. Application examples and NI FPGA hardware targets will also be covered.

Rick Kuhlman, LabVIEW FPGA Product Manager, NI

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 13A/B

Introduction to the LabVIEW Real-Time Module

Learn how you can use LabVIEW to create reliable, stand-alone monitoring and control systems. Also gain information on real-time OSs and related concepts such as jitter and determinism in the context of LabVIEW Real-Time.

Casey Weltzin, Product Manager, NI

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 13A/B

Software Engineering Best Practices for NI TestStand

Discuss recommendations on how power users perform common software engineering practices such as code reviews, documentation, requirements and bug tracking, standardization of shared code, static and dynamic validation, test plans, and release management for development in NI TestStand.

Ignacio Lopez, Software Design Engineer, and
Warren Scott, Engineer, Tektronix

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 11B

TECHNICAL SESSIONS

Software Engineering Tools for LabVIEW

As LabVIEW plays a larger role in increasingly complex systems, it's important that developers have access to software engineering tools that can help ensure application quality and reliability. Gain an overview of the LabVIEW tools that can help automate and improve some of the most time-consuming aspects of software engineering.

Elijah Kerry, LabVIEW Product Manager, NI

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 14

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 14

h Software Engineering With LabVIEW

Get hands-on experience with revision control, Subversion, NI Requirements Gateway, LabVIEW VI Analyzer, LabVIEW Unit Test Framework, and LabVIEW Desktop Execution Trace toolkits.

Elijah Kerry, LabVIEW Product Manager, NI

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 18C

Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 18C

a System Components With Object-Oriented Design Patterns

See how you can design and implement stand-alone, data-driven system components using applicable Gang-of-Four object-oriented design patterns and the model-view-controller composite architectural pattern. Learn why interfaces are important along with a simple way to create a basic functional equivalent in LabVIEW. Follow an example from state machine design to implementation incorporating reusable libraries.

Paul Lotz, DCT Software Engineering Manager, Lowell Observatory

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 14

a Team-Based Development Techniques and the Impact of Source-Only VIs

Learn configuration management best practices, including how to manage files using the LabVIEW Project Explorer, integration with popular source code control tools such as Subversion, and how the new source-only VI file format can help ensure that code changes do not cause a ripple effect through your application hierarchy.

Peter Guo and **George Martinez**, LabVIEW Senior Software Engineers, NI

Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 14

a The LabVIEW Compiler and Memory Management Techniques

Explore the internal workings of the LabVIEW compiler and execution engine and learn how to use those principles to optimize your code for improved run-time performance and memory use.

Adam Bordelon, Staff Software Engineer, NI

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 14

Tips and Tricks to Speed LabVIEW Performance

Join an interactive presentation that covers a variety of simple techniques to improve VI performance.

Darren Nattinger, Engineer, NI

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 17B

a Trends in LabVIEW Object-Oriented Programming

NIWeek 2011 marks five years since object-oriented features first appeared in LabVIEW. This style of LabVIEW programming continues to show its power. Examine interesting frameworks, online resources, and good programming practices that focus on new innovations since NIWeek 2010.

Stephen Mercer, Senior Software Engineer, NI

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 13A/B

TECHNICAL SESSIONS

a Advanced Topic
h Hands-On Topic

User Interface Tips 2.0

Discuss user interface design techniques and how to apply them to LabVIEW in this interactive presentation. Learn about conforming to Windows OS standards, user interactions, XControls, and .NET, as well as unique ways to display data.

Jonathan Cohn, Project Engineer, Bloomy Controls

Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 13A/B

What's New in LabVIEW Real-Time and LabVIEW FPGA

Take a tour through the latest improvements, watch a few demos, and learn how you can take advantage of new features to improve productivity and add new capabilities to your RIO-based systems.

Jonah Paul, Product Manager, NI

Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 13A/B

What's New in LabWindows/CVI 2010 and Beyond

Explore new features in LabWindows/CVI 2010 such as improved ANSI C developer productivity and simplified FPGA communication, and view a road map for future versions including a new compiler. Also see how multiplatform deployment support is extended with the LabWindows/CVI 2010 Real-Time Module and LabWindows/CVI 2010 Run-Time Module for Linux.

Luis Gomes, Software Group Manager, and

Anna Kozminski, Product Manager, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 11B

h Acquire and Process Sound and Vibration Signals

Learn how to perform signal processing with LabVIEW and how to develop systems for your audio, acoustic, or vibration tests.

Charlie Piazza, Product Engineer, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 18D

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 18D

a ATML – Now Ready for Full Use

The mission of the Automated Test Markup Language (ATML) is to define a collection of XML schemas that allows automated test equipment and test information to be exchanged in a common format adhering to the XML standard. Learn how ATML standards can help cut life-cycle costs and improve test information exchange.

James Hannah, President, RF Test and Measurement Solutions

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 15

Automotive Hybrid Power Electronics Test

Hybrid electric vehicles comprised of three-phase traction inverters, AC motors, and high-voltage converters have to be low cost, compact, powerful, and reliable. General Motors' hybrid power electronics group is developing a test automation system with NI hardware and software that gives engineers the ability to develop, design, and test the hybrid powertrain as a complex system in an environment capable of controlling, measuring, and simulating the device under test while maintaining environmental conditions.

Randy Maslovich, Senior Hybrid Validation Engineer, General Motors

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 15

h Build an Automated Test System From Scratch

Explore ways to develop an automated test system from start to finish and how to use NI TestStand to quickly sequence your measurements. Also discover ways to use LabVIEW to easily communicate with measurement instruments.

Jervin Justin, Product Manager, NI

Tuesday, August 2 ▸ 2:15–4:15 p.m. ▸ Room 18A

Wednesday, August 3 ▸ 1:00–3:00 p.m. ▸ Room 18A

Building Real-Time, High-Performance Computing Systems With NI PXI

As engineers push the limits of the single-processor computing system, the need for a scalable, high-performance computing platform with direct connections to I/O is emerging. Learn how you can use PXI to create a real-time high-performance computing system with heterogeneous computing elements and inline I/O.

Chetan Kapoor, Product Manager, NI

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 11B

Calibration Software Uncertainty Implementation Philosophies and Practices

Laboratory technical managers probably have differing opinions about how they'd like to see uncertainty analysis documented and implemented in software. Gain an overview of how these opinions are interpreted and implemented by different calibration software providers and how each has a different impact in the laboratory. Also discuss how each implementation philosophy may impact your laboratory modus operandi, method validation, records, and documentation.

Jorge Martins, Principal Metrology Engineer,

Laura Ramirez, Calibration and Test Software Group Manager, NI

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 12B

Characterization at the Speed of Light Using NI PXI and High-Speed Digital I/O

See how G Systems architected an I²C characterization system based on LabVIEW and NI TestStand software and NI PXI hardware. With this system, manufacturers can validate that all device characteristic timing and analog parameters meet the latest I²C specifications for digital circuit designs.

Rick Garza, Staff Engineer, G Systems

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 19B

Common Acoustic and Vibration Measurements Made Easy With LabVIEW

Learn about the fundamentals of time, frequency, and order-based signal analysis. Examine situations in which each is used and the easy-to-use LabVIEW tools that make them possible. See the concepts demonstrated with NI PXI hardware and signal analysis based on LabVIEW.

Michael Denton, Product Manager, NI

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 11B

h Create a Real-Time Test System With NI VeriStand

Get your hands on an NI VeriStand hardware setup.

Stephen Barrett, Systems Engineer, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 18A

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 18A

Creating High-Speed Streaming Systems With NI PXI

Learn how to architect high-speed data recording, processing, and playback applications incorporating NI modular instruments, hard disk arrays, and NI FlexRIO FPGA modules. Understand how to use high-throughput PXI Express chassis, controllers, and peer-to-peer (P2P) technology for systems with data throughput of up to 6.4 GB/s.

Chetan Kapoor and **Ryan Verret**, Product Managers, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 17B

a DAQ Advanced: Counters and Timing

Multifunction DAQ has expanded the functionality of counters and timing on a single data acquisition device. Learn about the enhancements in timing engines, triggering, and counter capabilities, and examine best practices for using them with NI-DAQmx.

William Earle and **Sunil Kowlgi**, Software Engineers, NI

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 12A

a DAQ Advanced: Signal Conditioning

NI products with built-in signal conditioning help you easily and accurately measure many types of sensors and signals. Learn best practices from NI data acquisition R&D for digital filtering, analog filtering, scaling, averaging, and measuring various sensor types.

Daniel Domene, R&D Group Manager, and

Zach Hindes, Software Engineer, NI

Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 15

Getting the Most Out of Your Data Using the TDMS File Standard

Collecting measurement data, saving it for reuse, and sharing it with others can be challenging because you have to balance many factors including file format size, structure and scalability, and ease of exchange. Explore the benefits of Technical Data Management Streaming (TDMS) as a file standard versus other storage techniques and learn data-saving best practices.

Doug Bendele, Senior Software Engineer,

Douglas Farrell, Product Engineer, and

Preston Johnson, Platform Manager, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 15

What's New With NI CompactDAQ

With more than 50 measurement modules and support for USB, Ethernet, and 802.11 Wi-Fi buses, NI CompactDAQ changes the way engineers and scientists design sensor and electrical measurement systems. Take a first look at the newest members of the product family, learn how this modular data acquisition platform can help you keep up with adapting measurement needs, and walk through a system setup.

Jim Schwartz, Product Engineer, NI

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 15

Hack Your Car With NI CAN Interfaces and LabVIEW

Learn the details of automotive diagnostics (OBD-II) and the controller area networking used in every car produced since 2008. Discover how to use LabVIEW and NI USB controller area network (CAN) interfaces to gain hidden data from your car, read diagnostic trouble codes, and build custom automotive diagnostic applications.

Noah Reding, Product Manager, NI

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 15

TECHNICAL SESSIONS

Hardware-in-the-Loop and Real-Time Testing Techniques

Real-time testing applications require greater reliability and determinism than a typical stimulus-response test system. Examine these applications and review the architectures, technologies, and new tools used to develop and implement them.

Nicholas Keel, Product Engineer, NI

Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 11A

HDMI 1.4 Test: Protocol, 3D, and Streaming Video Quality

HDMI-enabled devices such as smartphones, set-top boxes, and Blu-ray Disc players provide many challenges for validation and test engineers. Gain background knowledge on HDMI technologies and learn the latest techniques for testing HDMI protocol and streaming video quality.

Reggie Rector, Product Manager, NI

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 19B

How Fast Are the Fastest PXI Digitizers?

NI recently codeveloped and released a PXI Express digitizer with Tektronix. Learn about the capabilities of this device, how it works in the overall PXI platform, and early customer success stories using this device.

Rebecca Suemnicht, Senior Product Manager, NI

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 12A

How to Build Test Cell Applications Using NI VeriStand

Learn how to build test applications that use real-time control with NI VeriStand. Discuss how to implement multimode control with bumpless transfer between modes; controlled start-up, shut-down, and alarm procedures; and other features for test systems that use closed-loop control.

Darryn LaZar, Vice President of Sales, Wineman Technology Inc.

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 17A

🅐 Increase Embedded Software Quality With Test Component Reuse

Learn how to use LabVIEW, NI VeriStand, NI TestStand, DIAdem, and NI Requirements Gateway to implement a process that automates testing, analysis, and requirements traceability throughout multiple phases of embedded software development. Also learn how you can use these products and LabVIEW to create a simplified interface to the process.

Ricardo Santa Olalla, Systems Engineer, NI

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 15

🅗 Introduction to Data Acquisition

Learn how to select the proper data acquisition device from the world leader in PC-based data acquisition. Explore programming basics and learn how to design a reliable and powerful data acquisition application.

John Passiak, Engineer, NI

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 18D
Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 18D

Introduction to the NI PXI Platform

Learn the basics of the NI PXI platform and understand why top Fortune 500 companies are embracing it to address their test, measurement, and control needs. Also take a sneak peek at new products and customer solutions.

Chetan Kapoor, Product Manager, NI

Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 11B

LabVIEW Templates for Common Data Acquisition Applications

Are you tired of starting from a blank VI every time you begin a new project? Do you have problems trying to scale an NI-DAQmx example into a full application? Look at some extensible LabVIEW templates for common data acquisition applications.

Simon Hogg, LabVIEW Product Manager, NI

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 15

TECHNICAL SESSIONS

🅐 Advanced Topic
🅗 Hands-On Topic

Learn How Intel Technology Improves PXI System Manageability

PXI embedded controllers, powered by Intel processors, combine class-leading performance in a compact embedded form factor. Listen as Intel presents new manageability features for its processors and how NI integrates the technology into PXI embedded controllers for managing deployed automated test or control systems that need high uptime.

Sarah Schlonsky, Product Manager, NI
Jeffrey A. Snyder, Technical Marketing Manager, Intel

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 12B

Mobile Data Acquisition With Smartphones and Tablets

Smartphone and tablet adoption has exploded over the past few years. Watch as we compare the mobile platforms on today's market and learn how you can take advantage of these devices for portable or remote measurements.

Chris Delvizis, Product Manager, and
Joe Friedrichsen, Software Engineer, NI

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 11A

🅗 NI FlexRIO and LabVIEW FPGA

Build an NI FlexRIO system from scratch.

Barron Stone, Product Engineer, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 18A
Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 18A
Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 18A

NI FlexRIO and LabVIEW FPGA for Test Applications

Explore ways to use NI modular instruments, NI FlexRIO FPGA adapter modules, P2P data streaming, and LabVIEW FPGA to accelerate and enable new test applications. Focus on programming for PXI Express NI FlexRIO FPGA modules with DSP-focused Xilinx Virtex-5 FPGAs using new features in LabVIEW FPGA.

Ryan Verret, Product Manager, NI

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 11B

NI FlexRIO Out of the Box

Check out a new way to get up and running quickly with your NI FlexRIO hardware. Discuss a new LabVIEW FPGA default personality and host API that allows you to take measurements without compiling any FPGA code, providing data for better algorithm design and subsequent FPGA implementation.

David Klipec, Senior Software Engineer, and
Ryan Verret, Product Manager, NI

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 15

Optimize Your Test System and Reduce Test Time Using LabVIEW and NI TestStand

Discover how to optimize the performance of your automated test system by implementing parallel test using NI TestStand.

Jervin Justin, Product Engineer, NI

Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 11A

Optimizing DC Measurements for Speed and Stability

Learn techniques to reduce DC measurement time including tips for optimizing cabling, code, and instrument setup. With the right optimizations, engineers can significantly improve overall test time by reducing settling and aperture times within each measurement.

Travis White, R&D Group Manager, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 17B

Organizing Your Company's Test Data With the ATML Standard Using NI TestStand and DIAdem

Every department within a company wants to use its own file format for data collection, analysis, and archiving. Learn how the ATML standard can help you store truly parameterized and relational data that can be easily imported into a standard database and other applications including Microsoft Office and NI TestStand.

Christopher Relf, Chief Architect, V I Engineering Inc.

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 15

TECHNICAL SESSIONS

Performing Digital and Parametric Test With the Latest Digital Automated Test Equipment

NI combines the functionality of high-speed digital I/O with four-quadrant parametric measurements in one powerful and easy-to-use module. Learn how to use the latest PXI Express high-speed digital I/O with per pin parametric measurement unit (PPMU) modules to test common semiconductor components including digital-to-analog converters, RF power amplifiers, and microelectromechanical system (MEMS) devices.

Patrick Webb, Product Manager, NI

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 12B

Plan for Success With Automated Test

Whether you are writing your own test architecture or using off-the-shelf products like NI TestStand, know the common pitfalls of test frameworks and how a good design allows for reliable test execution as well as the flexibility to grow with the needs of a changing product/production environment.

Grant Gothing and **Elaine Ramundo**, Bloomy Controls Inc.

Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 15

Real-Time Testing for Automotive and Aerospace Systems

Efficient testing can ensure successful, error-free deployment of embedded controllers. Learn how you can use NI PXI and NI VeriStand to perform real-time tests such as hardware-in-the-loop and physical testing on automotive and aerospace systems.

Nicholas Keel, Product Engineer, and
Noah Reding, Product Manager, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 15

Real-Time Testing With NI VeriStand

NI VeriStand is a software environment for configuring real-time testing applications. While no programming knowledge is required to use NI VeriStand, you can use a variety of NI and third-party environments to add custom functionality. Gain an introduction to NI VeriStand and learn how you can use it to create real-time testing applications more efficiently.

Nicholas Keel, Product Engineer, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 12A

Reducing the Cost and Time of In-System Programming Test Applications With NI PXI

Learn how to increase productivity and improve your ROI on in-system programmable (ISP) and functional tests by exploiting the flexibility and versatility of the modular PXI platform. See how the EZ4000, an automated ISP and testing system, is easy to operate with a smooth programming environment to add new products.

Francisco Vazquez, Engineer, Testing House de Mexico S de RL de CV

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 15

Reliable Switching: A Day in the Life of a Relay

Learn how to develop sustainable switch systems that produce repeatable results. See demonstrations showing the most common causes of relay failure, and explore switching architectures that are optimized for low-level measurements.

John Sullivan, Product Engineer, NI

Thursday, August 4 ▸ 10:30–11:30 a.m. ▸ Room 17A

Standardize Your CAN Applications With NI-XNET

XNET products for CAN, LIN, and FlexRay networks make it easy to develop a single application that you can port to different environments and platforms including PXI, PCI, NI CompactDAQ, and CompactRIO. Learn how a single API and high-performance hardware can reduce development time for automotive network communication across multiple networks and platforms.

Noah Reding, Product Manager, NI

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 17A

Using LabVIEW to Find Meaningful Metrics for Automated Test

Learn how to process and analyze data in LabVIEW to create logical, useful metrics; understand key concepts of developing automated test metrics; and how these techniques have been applied to allow for microphone acquisition to be used in factory production environments.

Michael Albright, General Manager, Signal.X Technologies

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 11B

TECHNICAL SESSIONS

a Advanced Topic
h Hands-On Topic

a Using LabVIEW Within DIAdem for Advanced Reporting and Analysis

DIAdem offers many analysis options for dealing with large data sets, but what if you need custom analysis that is not natively supported in DIAdem? With LabVIEW and some basic DIAdem scripting, you can implement a variety of custom data analysis to suit your needs. Learn best practices for implementing such an application as well as examples of what's possible by integrating LabVIEW into DIAdem.

Douglas Farrell, Product Engineer, and
Preston Johnson, Platform Manager, NI

Thursday, August 4 ▸ 1:00–2:00 p.m. ▸ Room 19B

Using NI Hardware for Every Phase of Multimedia Device Testing

Averna used NI VideoMASTER and NI AudioMASTER to develop a flexible and configurable multimedia test platform capable of validating products throughout the design-to-repair life cycle. This sophisticated platform accommodates the design needs of design engineers and repair technicians. Learn about the platform that allows Averna to create custom and cost-effective test solutions that accelerate time to market while meeting customer requirements.

Andy Brown, Technology Development Manager, Averna

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 12A

Using PXI to Test an Analog Device With High Channel Count and Multifunctional Outputs

With the ability to quickly change from software commands, the NI PXI-5922 digitizer is an ideal tool for testing digital-to-analog output circuits.

Erika Beskar, Senior Validation Engineer, Texas Instruments

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 11A

a Using Real-Time Simulation With Real-Life Test Cell Applications

NI VeriStand combines test stimulus and data logging with real-time simulation and closed-loop control in a single software framework. See how this feature set is used to create new types of test systems that allow earlier and more thorough testing of physical systems by mechanically simulating missing components.

Darryn LaZar, Vice President of Sales, Wineman Technology Inc.

Wednesday, August 3 ▸ 4:45–5:45 p.m. ▸ Room 11A

h Watchdog Agent for Prognostics in LabVIEW

Experience the Watchdog Agent Toolkit that will bring prognostics to LabVIEW software. Developed with a National Science Foundation grant from the Intelligent Maintenance Systems Center, it features advanced analysis for pattern classification and failure prediction.

Preston Johnson, Platform Engineer, NI

Tuesday, August 2 ▸ 2:15–4:15 p.m. ▸ Room 18D

A Seat for Life: Custom-Designed CompactRIO Test Platform for Aircraft Seating

Recaro Aircraft Seating needed a structural life test solution that was user friendly, flexible, and easily configurable. See how G Systems and Recaro engineers developed a fully customizable control module to interface with a universal life-cycle test fixture using the CompactRIO platform and LabVIEW Real-Time for the control system.

Mike Taylor, Project Engineer, G Systems

Wednesday, August 3 ▸ 3:30–4:30 p.m. ▸ Room 12B

Best Practices for PXI Structural Test Systems

Structural test systems require complex software that combines a variety of measurement types, including strain, pressure, temperature, and vibration with precise control of an input stimulus. See LabVIEW architecture components that combine PXI sensor measurements with best-in-class synchronization for building high-channel-count structural test systems.

Shea Clymer, Group Manager, NI

Tuesday, August 2 ▸ 1:00–2:00 p.m. ▸ Room 12B

h Build Your Own PXI Structural Test System: Acquire and Analyze Real-World Data

Learn how to build your own structural test application in one hour by integrating strain acceleration channels with LabVIEW and PXI. Also try out NI PXI optical sensing technology.

Mike Denton, Product Manager, and
Brooks Campbell, Product Engineer, NI

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 18A
Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 18A

a Choose the Right Optical Sensor for Your Application

Fiber Bragg grating (FBG) optical sensing is the most versatile optical sensing technology, capable of measuring strain, temperature displacement, pressure, vibration and more. Learn how to practically use FBG optical sensors and how to select the best ones for your application.

Chris Baldwin, Technical Director – Optical Sensors, Aither Engineering Inc.
Tom Graver, Director of the Optical Sensing Group, Micron Optics

Tuesday, August 2 ▸ 2:15–3:15 p.m. ▸ Room 12B

a Evaluate Structural Noise and Integrity With Microphones and PXI

See how you can combine acoustic holography vision and LabVIEW to build a better system to identify noisy components in structural or electronic designs.

Youngkey Kim, CEO, SM Instruments

Wednesday, August 3 ▸ 2:15–3:15 p.m. ▸ Room 12B

Introduction to Fiber-Optic Sensing

Optical sensing helps engineers and scientists perform previously difficult or impossible measurements. Learn how optical sensing differs from electrical measurements, discover the benefits of optical sensing, and get an overview of various technologies.

Nathan Yang, Product Manager, NI

Tuesday, August 2 ▸ 10:30–11:30 a.m. ▸ Room 12B

Load Control for Testing Mechanical Structures Using LabVIEW

New trends in industrial control technology give structural test engineers many options for how they apply load patterns to mechanical structures. See some of the new trends in servo-hydraulic and electromechanical actuators and how to communicate with and control them using LabVIEW.

Shea Clymer, Group Manager, NI
Matthew Eurich, Vice President of Engineering and Operation, Wineman Technology Inc.

Thursday, August 4 ▸ 2:15–3:15 p.m. ▸ Room 11A

Making CompactRIO Web Accessible for SHM of Radar Structures

Structural health monitoring (SHM) systems based on CompactRIO have been deployed in remote locations. They continuously monitor and process data from more than 60 sensors, integrate several types of wireless technologies, and can be managed and viewed in real time via the web. Gain an overview of these SHM systems and discuss some of their key components and features.

Jody Cronenberger, Research Engineer, Southwest Research Institute

Wednesday, August 3 ▸ 1:00–2:00 p.m. ▸ Room 12B

Noise, Vibration, and Harshness LabVIEW Data Analysis in DIAdem for Heavy-Duty Machinery

Noise and vibration testing in heavy-duty trucks often requires a large number of data channels to capture tachometer-based torsional vibration data, linear vibration data from accelerometers, and acoustical data from microphones. Processing different data types for many files is time consuming and the risk for errors from a manual process is great.

Kevin Marsh, Noise, Vibration, and Harshness Specialist, Eaton Corporation

Tuesday, August 2 ▸ 3:30–4:30 p.m. ▸ Room 12B

Top Considerations for FBG Optical Sensing

FBG optical sensing is a proven technology that offers many benefits over conventional electrical sensors including immunity to electromagnetic interference (EMI)-induced noise and the ability to measure over long distances. Learn about the top considerations for FBG optical sensing, discover the NI optical sensor interrogator, and see a live demo.

Nathan Yang, Product Manager, NI
Chris Baldwin, Technical Director – Optical Sensors, Aither Engineering Inc.

Tuesday, August 2 ▸ 4:45–5:45 p.m. ▸ Room 12B

a Using NI Wireless DAQ for Real-World Structures

Real-world monitoring can be used to track behavior and detect damage in structures. Researchers are developing a wireless monitoring system for highway bridges that will support multiple sensors with sufficient computing power to process sensor data. See results from antenna testing at various steel bridges and case studies of real-world structural monitoring.

Jeremiah Fasl, Graduate Research Assistant, UT Austin

Wednesday, August 3 ▸ 10:30–11:30 a.m. ▸ Room 12B

UT STRUCTURAL LAB TOUR

Tour the Ferguson Structural Engineering Laboratory at UT Austin, one of the largest structural research facilities in the world. With a wide range of equipment and instrumentation, researchers conduct large-scale studies of civil engineering structures. Researchers use NI hardware and software tools in their testing, and are working with NI to research and develop wireless monitoring solutions for highway bridges. Tour participants should meet in the registration area at 1:00 p.m. for transportation.

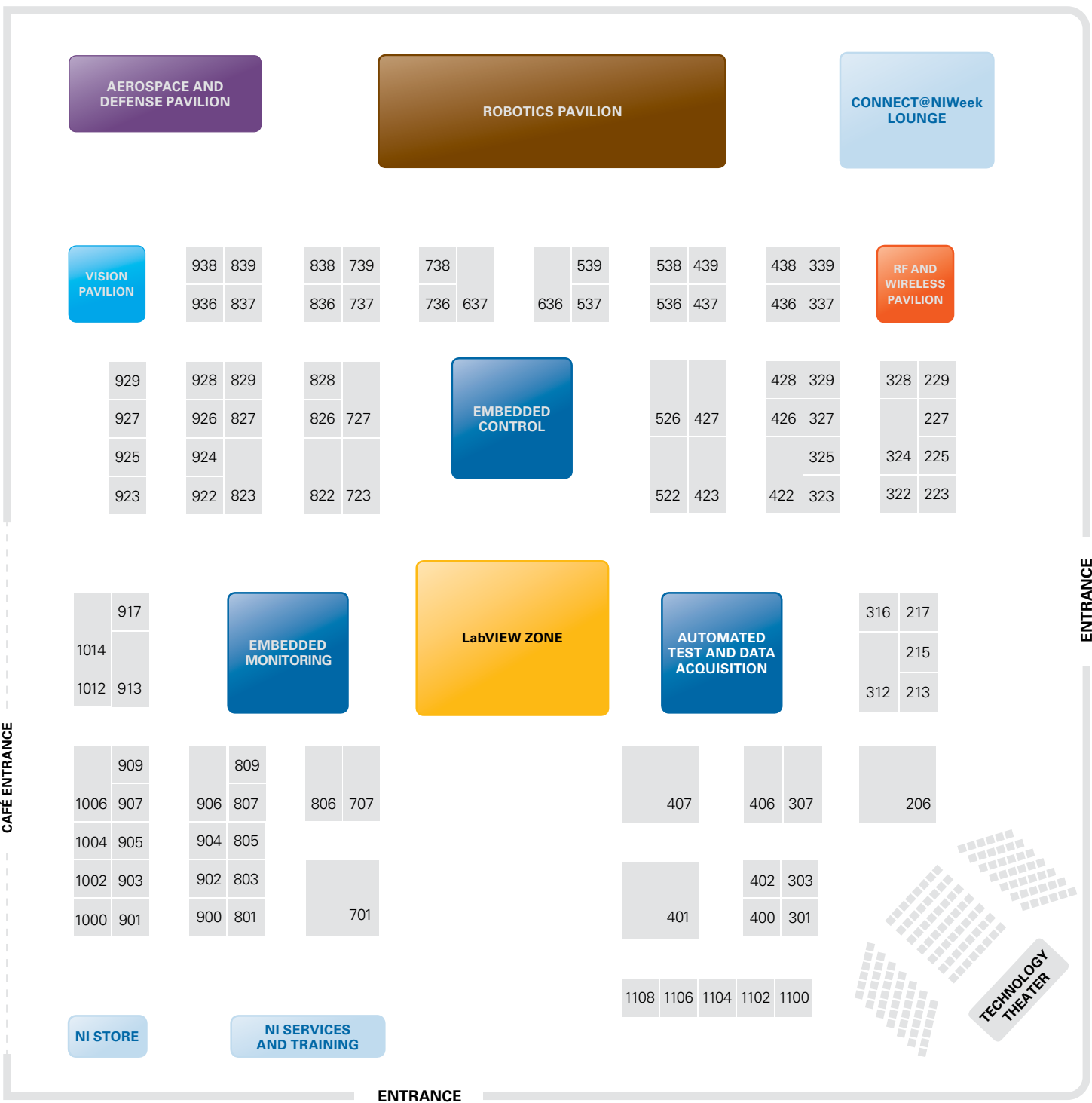Thursday, August 4 ▸ 1:00–3:30 p.m. ▸ J.J. Pickle Research Campus

EXHIBITION QUICK REFERENCE GUIDE

EXHIBITION HALL

EXHIBITION HALL HOURS

Monday, August 1	5:30–7:00 p.m.	Wednesday, August 3	10:30 a.m.–6:00 p.m.
Tuesday, August 2	10:30 a.m.–7:00 p.m.	Thursday, August 4	10:30 a.m.–1:00 p.m.

PRODUCT SHOWCASE

Visit the NI Product Showcase to see demonstrations of the latest NI hardware and software products, talk to NI developers, and discover ways to incorporate NI products into your, test, monitoring, and control applications.

LabVIEW ZONE

The LabVIEW Zone highlights how graphical system design helps users tackle some of the most challenging engineering and scientific problems of our time. Stop by to see examples of systems built with LabVIEW and to hear from users about how LabVIEW has increased their productivity. Also sign up for the Challenge the Champions contest and the LabVIEW Coding Challenge in the LabVIEW Zone.

AUTOMATED TEST AND DATA ACQUISITION

Check out the latest data acquisition and automated test applications ranging from a single-channel thermocouple device, to high-channel-count structural test, to 13 GHz automated test systems based on industry-leading PXI technology.

EMBEDDED CONTROL

Explore graphical system design as it applies to custom machines, next-generation power electronics, and motion control. Also see demos of the latest CompactRIO platform products and C Series modules.

EMBEDDED MONITORING

Check out demos of the latest NI products for smart grid and power monitoring, wireless sensor nodes, condition monitoring, and fiber-optic measurements.

CONNECT @NIWeek LOUNGE

Take a break and relax in the Connect @NIWeek Lounge in the back of the Exhibition Hall. In the lounge you'll find comfortable couches, Wi-Fi connection, and electrical outlets so you and your devices can recharge throughout the conference. Also access **ni.com/niweekcommunity** for real-time conference updates, view live feeds of social media conversations, and give feedback on the NI website.

GET SOCIAL SCREEN

Grab a spot on our sofas and watch conversations and photos from social media outlets scroll through. Also find out how you can "Like," "Follow," or "Friend" NIWeek to get official conference information and participate in fun activities.

ni.com FACE-TO-FACE

Have an idea, gripe, or compliment for **ni.com**? Want to see what new online experiences and tools we are rolling out? Stop by the interactive **ni.com** booth and get face-to-face time with our web experts and site engineers to share your thoughts. Win prizes for participating in web-based challenges and games.

COMPUTER BAR

Snag a computer workstation and check your email or NIWeek session schedule online. Also learn how you can stay connected during and after NIWeek by joining the online community at **ni.com/niweekcommunity** to view keynote presentations, download code, watch videos of key demos, read blog posts, and more.

TUESDAY NIGHT SCAVENGER HUNT

Spice up the NI Community *Block Diagram* Party with some friendly competition. Compete individually or grab a partner and meet in the Connect @NIWeek Lounge at 6:20 p.m. for a list of challenges that'll send you to all corners of the expo floor. Think you can form the longest conga line or master our "Angry Eagles" demo? Get the most points after an intense 20-minute race and take home an awesome grand prize. We want to see your pictures from the event too, so some challenges may include the occasional tweeting and Facebook posting.

Tuesday, August 2 ▸ 6:20–6:40 p.m. ▸ Exhibition Hall

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INDUSTRIAL NETWORKING

TECHNOLOGY THEATER

Tuesday, August 2	11:00–11:30 a.m.	*FIRST* 101: How to Get Involved
	Noon–12:30 p.m.	Extreme-Speed HIL on NI Real-Time Platforms
	1:00–1:30 p.m.	Design and Simulation Using Multisim, LabVIEW, and Other NI Tools
	2:00–2:30 p.m.	Live Demonstration of the New High-Performance CompactRIO Module
	3:00–3:30 p.m.	High-Speed, High-Throughput Part Inspection System Running LabVIEW Real-Time and NI Vision Over 8 CPU Cores
	4:00–4:30 p.m.	The Future of Condition Monitoring: Bringing Prognostics to Market
	5:45–6:15 p.m.	Challenge the Champions
Wednesday, August 3	11:00–11:30 a.m.	Embedded Processing Solutions for Industrial Applications
	Noon–12:30 p.m.	Industrial Robotics Applications With Intel Processors
	12:30–1:00 p.m.	Where Passion and Drive Meet – The Hermes Spacecraft Project
	1:00–1:30 p.m.	Extreme-Speed HIL on NI Real-Time Platforms
	2:00–2:30 p.m.	Spintronics Simulations – High-Performance Computing Based on LabVIEW for the Future of Computing
	3:00–3:30 p.m.	Jumpstarting Distributed Process Control and Data Logging Applications in LabVIEW
	4:00–4:30 p.m.	High-Fidelity Real-Time Simulation Using LabVIEW
Thursday, August 4	11:00–11:30 a.m.	LabVIEW in High School: Get Real About Teaching Science and Engineering
	Noon–1:00 p.m.	LabVIEW Coding Challenge Finals

Challenge the Champions
Sign up in the LabVIEW Zone to participate in an interactive trivia competition that puts a team of NIWeek contestants against the LabVIEW Champions for bragging rights and prizes.
Presented by National Instruments

Design and Simulation Using Multisim, LabVIEW, and Other NI Tools
See innovative examples and concepts of how to use simulation and virtual instrument technology to solve engineering and manufacturing challenges for product design and test.
Presented by Sennheiser New Mexico LLC

Embedded Processing Solutions for Industrial Applications
Explore the revolutionary idea of flexibility for custom electronic design through the integration of traditional processor systems and FGPAs.
Presented by Xilinx

Extreme-Speed HIL on NI Real-Time Platforms
Learn how to quickly develop high-fidelity physical plant models that run on NI real-time platforms faster than conventional approaches, and review applications in automotive, aerospace, power, and other industries.
Presented by Maplesoft

TECHNOLOGY THEATER

FIRST 101: How to Get Involved
Everybody's doing it. Learn how your company can get involved in *FIRST* by donating time, talent, or dollars to the largest after-school robotics competition in the world.
Presented by National Instruments

High-Fidelity Real-Time Simulation Using LabVIEW
Complex high-fidelity simulations typically require offline finite element analysis on high-end computing platforms. See how these simulations can be executed in real time with LabVIEW on standard deployment platforms like PXI and CompactRIO.
Presented by MIT Mechanical Engineering and Harvard University School of Engineering and Applied Science

High-Speed, High-Throughput Part Inspection System Running LabVIEW Real-Time and NI Vision Over 8 CPU Cores
This system delivers 320 MB/s image data from two 4 megapixel cameras using two NI PCIe-1427 Camera Link frame grabbers and an NI PCI-6254 DAQ board for high-speed encoder triggering.
Presented by moviMED

Industrial Robotics Applications With Intel Processors
Intel processors are becoming an increasingly important component in industrial embedded systems. Examine applications and architectures that benefit from hardware and software platforms optimized for Intel architectures.
Presented by Intel

Jumpstarting Distributed Process Control and Data Logging Applications in LabVIEW
Explore a LabVIEW framework that implements your application's most common needs: data logging, data analysis, process monitoring and control, display and reporting, remote access, and the ability to customize.
Presented by Jova Solutions

LabVIEW Coding Challenge Finals
Watch the highest scorer in the week-long LabVIEW Coding Challenge compete against a member of LabVIEW R&D in a live coding competition.
Presented by National Instruments

LabVIEW in High School: Get Real About Teaching Science and Engineering
Meet the new STEM teaching platform. Learn how NI myDAQ and LabVIEW for Education turn any high school classroom into a full-feature science and engineering learning station.
Presented by National Instruments

Live Demonstration of the New High-Performance CompactRIO Module
Enjoy a first-hand introduction to the new high-performance CompactRIO module featuring a dual-core 1.33 GHz Intel processor. Watch as we take this CompactRIO target out of the box and all the way to a functioning embedded system. Learn the basics and how to get up and running quickly with this powerful new target.
Presented by National Instruments

Spintronics Simulations – High-Performance Computing Based on LabVIEW for the Future of Computing
Learn about a high-performance simulator based on LabVIEW to solve the Schrödinger Equation describing spin-dependent transport in nanostructures for future computing architectures beyond CMOS and Moore's Law.
Presented by University of Hamburg Institute of Applied Physics and Microstructure Research Center and National Instruments

The Future of Condition Monitoring: Bringing Prognostics to Market
While the science and practice of condition monitoring is well understood, prediction technologies (or prognostics) remain a science under development. Examine these techniques, industrial case studies, and their future in the market.
Presented by the University of Cincinnati Intelligent Maintenance Systems Center and National Instruments

Where Passion and Drive Meet – The Hermes Spacecraft Project
Join the creators of the Hermes Spacecraft for a brief discussion of what the next generation of space enthusiasts are building. Learn about the Hermes design and test methodology, including current test results and valuable lessons learned while testing.
Presented by the Hermes Spacecraft Project Team

AEROSPACE AND DEFENSE PAVILION

Discuss your applications with NI engineers presenting live demonstrations of the latest technologies for automated test and embedded design at the Aerospace and Defense Pavilion. See demonstrations including hardware in the loop, structural test and monitoring, RF, wireless measurements, and more.

▶ **Software-Defined RF Test**

Learn about the integrated NI PXI platform for RF measurements, including spectral monitoring and SIGINT, P2P data analysis with FPGAs, RF record and playback, and GPS receiver test.

▶ **Structural Test and Monitoring**

See how PXI Express and LabVIEW provide instrumentation-grade I/O and industrial-grade control to perform any test on any structure.

▶ **HIL Simulation and Test**

Provide stimuli to a flight controller using a joystick or autopilot on a simulated plane. View how the controller commands the control surfaces on a physical model and observe simulated flight information through a digital display.

▶ **Prototyping and Deployment With RIO**

Discover how Ventura Aerospace delivered a custom embedded monitoring and fire control suppression system for FedEx Express in record time. See how NI RIO hardware supports hardware integration.

▶ **NI Software Showcase**

Learn how NI software tools reduce development time and improve test execution performance as exemplified by testing a jet fighter pilot helmet and its head-up display.

▶ **Parallel Test With Hybrid Instrumentation**

Explore a DUT with PXI, VXI, and LXI/USB/GPIB instruments. Learn about IVI software compatibility, PXI speed advantages, and autoscheduling and parallel test with NI TestStand.

▶ **Wireless Measurements**

Learn how wireless measurement devices can provide test and monitoring systems with increased flexibility and lower costs. Discover how different wireless technologies can meet a variety of remote application challenges for which a cabled solution may be impractical or impossible.

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RF AND WIRELESS PAVILION

Stop by the RF and Wireless Pavilion to learn more about the fast, flexible, and accurate PXI platform from National Instruments that industry leaders are using to meet the demanding test requirements of today's RF and wireless test devices.

▶ **Reduce Test Time With the PXI Platform**

PXI instruments use high-performance, multicore processors to dramatically reduce test times and lower test costs. View demonstrations of multiple test systems using software-defined instrumentation to meet the time-sensitive needs of validation and production test. Also watch demonstrations that showcase the high-speed PXI Express data bus for streaming applications, including multichannel RF record and playback and P2P streaming for real-time user-defined FPGA processing.

▶ **Prototype, Validate, and Test on a Single Platform**

With the flexibility and accuracy of PXI RF instruments, you can use the same set of RF hardware for a MIMO transceiver, a GPS simulator, and a communications tester for protocols ranging from GSM, WCDMA, and LTE to GPS, WLAN, WiMAX, ZigBee, and Bluetooth. At the RF and Wireless Pavilion, see how you can use the software-defined PXI platform to meet the fast-evolving needs of the wireless industry. View the following demonstrations implementing this software-defined approach:

– *Industry's best-in-class PXI vector signal analyzer*

– *Microwave signal analysis to 26.5 GHz in PXI*

– *Over-the-air MIMO antenna characterization with the industry's first PXI vector network analyzer*

– *High-throughput power amplifier validation test*

– *FPGA-enabled software-defined radio*

ROBOTICS PAVILION

The Robotics Pavilion is an interactive exhibit demonstrating how LabVIEW software and NI embedded hardware platforms are used across the robotics landscape in academia and industry. Visit the pavilion to learn how the NI robotics platform helps students, engineers, and scientists rapidly develop everything from competitive robots that play sports to medical robots used for telediagnosis of stroke attacks.

▶ **Robotics in Action**

Stop by the Robotics Pavilion to see how LabVIEW and NI hardware are used in a range of robotics applications:

– *See biomimetic robots including Boston Engineering's tuna-like autonomous underwater vehicle (AUV)*

– *Play a game of chess, pool, or soccer against an autonomous robot designed by students*

– *Watch industrial and military unmanned robots explore aggressive terrain*

– *Test-drive the latest features in the LabVIEW Robotics Module and check out the latest version of the LabVIEW Robotics Starter Kit*

▶ **LabVIEW Robotics**

Robots mean many things to many people, and NI offers intuitive and productive design tools for everything from robot arms to unmanned systems. LabVIEW Robotics helps roboticists design complex applications faster by providing a high level of abstraction for sensor communication, obstacle avoidance, path planning, kinematics, steering, and more. Check out the latest LabVIEW Robotics software at the Robotics Pavilion.

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VISION PAVILION

Stop by the Vision Pavilion to see machine vision solutions in action and test-drive the full line of NI vision hardware and software at the vision product hands-on station. Speak with vision industry experts, component providers, and systems integrators to get your vision applications up and running.
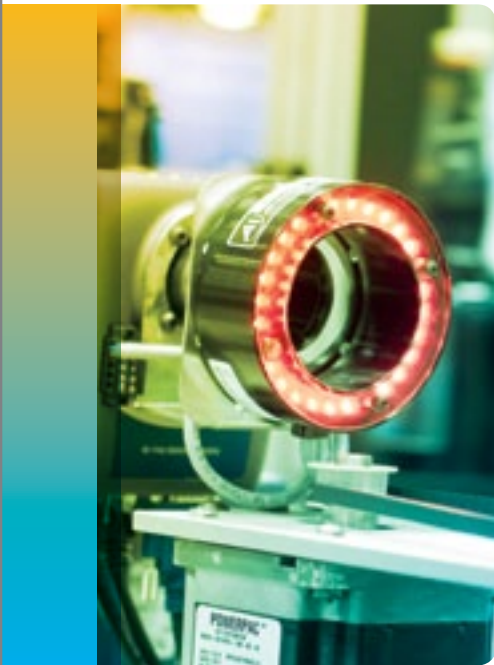
▶ **See Machine Vision in Action**

Discover how industry experts are integrating NI vision products into complete, real-world solutions.

▶ **Meet the Experts**

Speak with experts from many of the world's leading vision companies about how you can successfully employ NI vision hardware and software in your applications. Talk to NI engineers about the new features in the NI Vision Development Module and how to integrate them in your current and future projects.

▶ **Complete Your Vision System**

View product demonstrations and speak with vision exhibitors about lighting, cameras, optics, and systems integration. Visit with partners and integrators about how their products and services can make your vision application come to life when combined with NI vision products.

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Vision Exhibitors at NIWeek

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e2v	NET USA
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Visit the NI Services and Training Booth to learn about a variety of product and professional services as well as training and certification programs to meet your needs at every stage of the application life cycle – from planning and development through deployment and ongoing maintenance.

▶ **NI Offers a Wide Range of Services**

Hardware Services – Warranty and repair, calibration, and system assurance

Software Services – Software support, maintenance, and volume licensing

Training and Certification – Training on key software and hardware offerings and multiple certification levels

▶ **NI Services and Training Solutions Ensure Your Success**

– *Shorten your application development time by half*

– *Stay up-to-date with the latest LabVIEW features*

– *Keep your hardware instruments operating more efficiently and accurately with calibration*

▶ **Visit the NI Services and Training Booth**

Conveniently located near the main entrance to the Exhibition Hall, the NI Services and Training Booth is the best place to learn more about NI hardware, software, and professional service offerings as well as training and certification.

– *Register to win a one-year training membership valued at $6,000 USD*

– *View demos and information about calibration, technical support, and training*

– *Learn about professional development opportunities through training and certification at NIWeek and in your area*

– *Make an appointment for a demo of LabVIEW 2011 with one of our applications engineers*

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3M's Interconnect business offers innovative connectors, cables and cable assemblies, embedded capacitor materials, and Textool brand test and burn-in sockets for engineers and designers.

3m.com/electronics

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Booth 936

Adsys Controls, a LabVIEW system integrator and custom design house, provides services and products for imaging systems, control systems, and automated test equipment.

adsyscontrols.com

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Advanced illumination
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An LED lighting solutions provider, Advanced illumination designs and manufactures versatile lighting for the machine vision industry, including standard and customized LED fixtures and electronics.

advancedillumination.com

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alfautomazione.com

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alliedvisiontech.com

AmFax Ltd
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avitech.com

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cim.as

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cimat.mx

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qpsk.com

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ESTECO's process integration and design optimization software, modeFRONTIER, can be coupled to LabVIEW for hardware-in-the-loop optimization and to tune simulation models with experimental data.

esteco.com

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imaginglab.it

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macpanel.com

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micronoptics.com

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spectraquest.com

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tattile.com

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us.tdk-lambda.com/hp

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tescomusa.com

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testequity.com

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ti.com

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toshiba-teli.co.jp

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texasmstc.org

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vibetech.com

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vpc.com

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virinco.com

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vi-china.com.cn

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